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January 8, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

January 8, 1985 Volume 1050 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1042 O.G. 45 on May 15, 1984.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced in the *Official Gazette* at 1039 O.G. 142 on Feb. 21, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

Apr. 13, 1984.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Board of Appeals Decisions Rendered in the Month of Nov. 1984

Affirmed	154
Affirmed in Part	27
Reversed	91
Total	272

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Jan. 5, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,308,622 through 4,309,773

Reissue Patents based on the above identified patents. No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,256,381, Re. S.N. 659,334, Filed Oct. 10, 1984, Cl. 350/423, ZOOMS LENS, Melvyn H. Kreitzer, Owner of Record: *Vivitar Corp., Santa Monica, Calif.* Attorney or Agent: Peter L. Costas, et al., Ex. Gp.: 257

4,353,086, Re. S.N. 658,189, Filed Oct. 5, 1984, Cl. 357/051, SILICON INTEGRATED CIRCUITS, Ralph J. Jaccodine, et al., Owner of Record: *Bell Telephone*

Laboratories, Inc., Murray Hill, N.J., Attorney or Agent: S. E. Hollander, et al., Ex. Gp.: 253

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,777,283, Reexam. No. 90/000,679, Requested: Dec. 3, 1984, Cl. 356/246, TRANSPARENT SLIDE FOR THE EXAMINATION OF LIQUID SPECIMENS, Carlos D. Elkins, Owner of Record: *Carlos D. Elkins, Whittier, Calif.,* Attorney or Agent: Edgar W. Averill, Ex. Gp.: 250, Requester: Owner

3,855,129, Reexam. No. 90/000,681, Requested: Dec. 5, 1984, Cl. 210/198.2, NOVEL PUMPING APPARATUS, Louis Abrahams, et al., Owner of Record: *Waters Assoc., Inc., Framingham, Mass.,* Attorney or Agent: James & Franklin, Ex. Gp.: 130, Requester: Owner

4,060,953, Reexam. No. 90/000,678, Requested: Dec. 3, 1984, Cl. 52/743, ARTIFICIAL AND NATURAL STRUCTURES, James Milne, Owner of Record: *Balfour Beatty & Co., Ltd., Croydon, England,* Attorney or Agent: Eugene F. Buell, Ex. Gp.: 354, Requester: Eugene F. Buell, Pittsburgh, Pa.

4,108,029, Reexam. No. 90/000,682, Requested: Dec. 10, 1984, Cl. 083/054, CUT-OFF DIE SET, Alexander Borzym, Owner of Record: *Alpha Industries, Inc., Detroit, Mich.,* Attorney or Agent: Krass and Young, Ex. Gp.: 324, Requester: Vogel Tool & Die Corp.; Chicago, Ill.

4,146,437, Reexam. No. 90/000,671, Requested: Nov. 23, 1984, Cl. 204/1, METHOD FOR EVALUATING A SYSTEM FOR ELECTRODEPOSITION OF METALS, Thomas O'Keefe, Owner of Record: *Curators of the University of Missouri, Columbia, Mo.,* Attorney or Agent: J. K. Roedel, Ex. Gp.: 110, Requester: Rockwell International Corp., Thousand Oaks, Calif.

4,232,679, Reexam. No. 90/000,677, Requested: Dec. 4, 1984, Cl. 128/419, PROGRAMMABLE HUMAN TISSUE STIMULATOR, Joseph H. Schulman, Owner of Record: *Pacesetters Systems, Inc., Sylmar, Calif.,* Attorney or Agent: Lynch, Sherman & Cox, Ex. Gp.: 335, Requester: Owner

4,305,091, Reexam. No. 90/000,674, Requested: Dec. 3, 1984, Cl. 358/36, ELECTRONIC NOISE REDUCING APPARATUS AND METHOD, J. Carl Cooper, Owner of Record: *Inventor,* Attorney or Agent: Charles R. Rust, Ex. Gp.: 262, Requester: Harris Corp., Cleveland, Ohio

4,330,280, Reexam. No. 90/000,669, Requested: Nov. 13, 1984, Cl. 433/90, EJECTOR HOLDER FOR CAPSULE-LIKE CARTRIDGE, Emery W. Dougherty, et al., Owner of Record: *Dentsply Research Development Corp, Milford, Del.,* Attorney or Agent: C. Hercus Just, Ex. Gp.: 330, Requester: William B. Dragan, Stratford, Conn.

4,335,570, Reexam. No. 90/000,684, Requested: Dec. 10, 1984, Cl. 56/327R., HARVESTING SHAKER FOR CROPS SUCH AS TOMATOES OR THE LIKE, Richard W. Fitzmaurice, Owner of Record: *FMC Corp., San Jose, Calif.,* Attorney or Agent: Henry M. Stanley, Ex. Gp.: 333, Requester: FMC Corp., Chicago, Ill.

4,363,679, Reexam. No. 90/000,683, Requested: Dec. 6, 1984, Cl. 149/37, USE OF ZINC PEROXIDE AS OXIDANT FOR EXPLOSIVES AND PYROTECHNICAL MIXTURES, Rainer Hagel, et al., Owner of Record: *Dynamit Nobel Aktiengesellschaft, Postfach, W. Germany,* Attorney or Agent: Felfe & Lynch, Ex. Gp.: 220, Requester: Owner

4,445,789 Reexam. No. 90/000,680, Requested: Dec. 4, 1984, Cl. 374/198, THERMOMETER OR OTHER INSTRUMENT ASSEMBLY, Edward L. Peart, et al., Owner of Record: *Sybron Corp., Rochester, N.Y.,* Attorney or Agent: Theodore B. Roessel, Ex. Gp.: 246, Requester: Sybron Corp., Rochester, N.Y.

National Inventors Expo

The Patent and Trademark Office, the National Council of Patent Law Associations and the National Inventors Hall of Fame Foundation, Inc., will sponsor the Thirteenth Annual National Inventors Expo in the Public Search Room on Saturday, Feb. 9, 1985 from 1:00 p.m. to 5:00 p.m. and Sunday, Feb. 10, 1985 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days. Inventors will be inducted into the National Inventors Hall of Fame on Sunday, Feb. 10 at 2:00 p.m.

In order to assemble the exhibits it will be necessary to close the Search Room on Friday, Feb. 8, 1985 at 5:00 p.m. The removal of all personal property from the Search Room would be appreciated.

Dec. 18, 1984.

GERALD J. MOSSINGHOFF
Commissioner of Patents and Trademarks.

Errata

"All reference to Patent No. RE31756 to John Gagliani, et al. of Calif. for 'MODIFIED POLYIMIDE FOAMS AND METHODS OF MAKING SAME' appearing in the Official Gazette of Dec. 4, 1984, should be deleted since no patent was granted."

"All reference to Patent No. 4,483,542 to Joseph H. Hynes, et al. of Tex. for 'ANNULAR PACKING UNIT AND INSERT' appearing in the Official Gazette of Nov. 20, 1984 should be deleted since no patent was granted."

"All reference to Patent No. 4,485,030 to Terence A. Clarke, et al. of United Kingdom for 'DETERGENT BAR PROCESSING' appearing in the Official Gazette of Nov. 27, 1984 should be deleted since no patent was granted."

"All reference to Patent No. 4,486,409 to Marcia F. Goldfarb of Me. for 'INDUCER OF T-SUPPRESSOR CELLS' appearing in the Official Gazette of Dec. 4, 1984, should be deleted since no patent was granted."

"All reference to Patent No. 4,487,758 to Mattheus F. A. Goosen, et al., of Canada for 'MICROENCAPSULATION OF LIVING TISSUE AND CELLS' appearing in the Official Gazette of Dec. 11, 1984, should be deleted since no patent was granted."

"All reference to Patent No. 4,490,332 to Jacqueline J. Jackson, et al. of Colo. for 'GAS FLOW CARTRIDGE HAVING RESILIENT FLEXIBLE MEMBRANE WITH SLIT SEPARATING REACTION AND REAGENT CHAMBERS' appearing in the Official Gazette of Dec. 25, 1984, should be deleted since no patent was granted."

U.S. GOVERNMENT-OWNED INVENTIONS
Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve ex-

peditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Federal Patent Licensing
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Office of Federal Patent Licensing
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-308,747 (4,461,167). PSYCHROMETER FOR MEASURING THE HUMIDITY OF A GAS FLOW.
SN 6-423,403 (4,464,392). PROCESS FOR CONTROLLING ANTIMICROBIAL ACTIVITY USING GLYCOLIC ACID DERIVATIVES.
SN 6-443,995 (4,464,390). CONTROL OF PARASITIC MITES WITH ALKYL CARBAMATES.
SN 6-524,179 (4,464,295). SIMPLE AND RAPID METHOD FOR EXTRACTION OF PROTEINS FROM BACTERIA.
SN 6-539,860 (4,464,296). SOLUBILIZATION OF DRY PROTEIN IN AQUEOUS OR ACIDIC MEDIA AFTER TREATMENT WITH CONCENTRATED HYDROGEN PEROXIDE.
SN 6-573,748. ROLLER CHOPPER TRANSPORT CARRIAGE.
SN 6-625,266. COCKROACH REPELLENTS.
SN 6-625,328. INSECT REPELLENTS.
SN 6-626,329. COCKROACH REPELLENTS.
SN 6-626,960. NEW MALONIC ESTER DERIVATIVES.
SN 6-635,945. PROCESS FOR STABILIZING WHOLE CEREAL GRAINS.
SN 6-636,451. LOW WET PICKUP FABRIC FINISHING APPARATUS.

DEPARTMENT OF COMMERCE

SN 6-370,772 (4,464,401). ACOUSTIC THAWING OF FROZEN FOOD.

DEPARTMENT OF THE ARMY

SN 6-611,570. SLUDGE DEWATERING BY FREEZING.

DEPARTMENT OF THE INTERIOR

SN 6-200,110 (4,464,338). IN SITU TRITIUM BOREHOLE PROBE FOR MEASUREMENT OF TRITIUM.

Published Trademark Applications

Papers which are filed in the Patent and Trademark Office in connection with published trademark application files should be captioned to the attention of the Trademark Quality Review Clerk and addressed as follows:

Commissioner of Patents and Trademarks
Attention: Box 5, Trademark Quality Review Clerk
Washington, D.C. 20231

This mailing should be used only for papers filed after publication but before issuance of the registration. This could include corrections to information which appears to have been inadvertently or incorrectly published in the Trademark Official Gazette, as well as changes of attorney or address papers or notification of filing an assignment. Corrections to information published in the TMOG must be received in the Office before the registration is issued.

Use of this mailing address for corrections will help ensure that such papers are properly routed within the Office. Telephone inquiries concerning corrections or other matters in relation to published trademark applications should be directed to (703) 557-4249.

Dec. 10, 1984. MARGARET M. LAURENCE
Assistant Commissioner for Trademarks.

Initial Guidelines Implementing Changes in 35 U.S.C. 103, 116, and 120

The Patent and Trademark Office has established initial guidelines for patent examiners to use in implementing the changes made in 35 U.S.C. 103, 116, and 120 by Public Law 98-622, the Patent Law Amendments Act of 1984. As a service to the public, those guidelines are published below. A copy of Public Law 98-622 is also being published concurrently herewith. Some of the procedural aspects of matters contained in the guidelines will be incorporated into Title 37 of the Code of Federal Regulation through the rule-making process.

Dec. 11, 1984. RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

Initial Guidelines As To Implementation Of 35 U.S.C. 103

Public Law 98-622 added a new sentence to 35 U.S.C. 103 which reads as follows:

"Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person."

The significant features resulting from this amendment to §103 are the following:

(1) The only prior art which is disqualified is prior art under §102(f) or (g) where the subject matter, i.e., the prior art, and the invention "were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person." (Person includes organization.)
(2) If the subject matter (prior art) qualifies as prior art under any other section, e.g., §102(a), (b), or (e), it is still prior art and can be used.
(3) Amendment applies only to subject matter which qualifies as prior art under §103; it does not affect subject matter which qualifies as prior art under §102, i.e., anticipatory prior art.
(4) Term "another person" means any inventive entity other than the inventor and includes the inventor and any other person.
(5) Term "developed" is to be read broadly and is not limited to any particular manner of development.
(6) Subject matter derived from another under §102(f) is prior art under §103 unless the derived subject matter and the claimed invention are owned by, or subject to an obligation of assignment to, the same person at the time the claimed invention was made.
(7) The disclosure of an earlier filed patent application which issues as a patent continues to be prior art under §102(e) against a later invented and filed application of another inventor even though the patent and the later application are owned by, or sub-

ject to an obligation of assignment to, the same person.

(8) Commonly owned applications, i.e., applications owned by the same person, may be refiled as a single application to avoid one or more of them becoming prior art against another under §§102(e) and 103.

(9) The phrase "owned by the same person" requires that the same person, persons, or organization own 100% of the subject matter (prior art) and 100% of the claimed invention.

(10) The phrase "subject to an obligation of assignment to the same person" requires that a legal obligation of assignment exist and not merely a moral or unenforceable obligation.

(11) As long as the same person owns the subject matter and the invention at the time the claimed invention was made, a license to another may be made without the subject matter becoming prior art.

(12) Amended §103 requires actual ownership (or obligation to assign) be in existence at the time the claimed invention is made for the subject matter to be disqualified as prior art; acquiring one or the other later is not sufficient.

(13) Burden of establishing that subject matter is disqualified as prior art is placed on patent applicant and not on the patent examiner once the examiner establishes a prima facie case of obviousness based on the prior art.

(14) Double patenting rejections may now be made in applications based on commonly owned patents of different inventive entities and double patenting rejections of the obviousness type can be overcome by terminal disclaimers.

(15) A double patenting rejection may also be made in a later filed application where the application/patent on which the rejection is based and the later filed application are not commonly owned as long as one of the inventors is common between the later filed application and the application/patent; such a rejection cannot be overcome by terminal disclaimer in view of the lack of common ownership.

(16) The Commissioner's Notice of January 9, 1967, "Double Patenting", 834 O.G. 1615 (Jan. 31, 1967) is withdrawn to the extent that it does not authorize a double patenting rejection where different inventive entities are present.

(17) Inventors of subject matter not commonly owned at the time of the invention may file as joint inventors in a single application. However, the claims in such an application are not protected from a §102(f)/103 or §102(g)/103 rejection.

Implementation Steps As To Amended 35 U.S.C. 103

A. Applications To Be Considered

(1) Amended §103 does not "affect any final decision made by the court or the Patent and Trademark Office before the date of enactment [November 8, 1984]... with respect to a patent or application for patent, if no appeal from such decision is pending and the time for filing an appeal has expired."

(2) The amendment of §103 will *not* be considered to apply to:

(a) Any application which has been abandoned prior to November 8, 1984, unless such application is revived pursuant to the provisions of 37 CFR 1.137(a) or (b) and is pending on or after November 8, 1984;

(d) Any application in which all the claims have been allowed and in which prosecution has been closed prior to November 8, 1984, e.g., by an *Ex parte Quayle* action, a Notice of allowability, or a Notice of Allowance. However, a continuing application would obtain the benefit of amended §103 if filed prior to the abandonment or issuance of the application; and

(c) Any application in which an appeal has been filed and is no longer pending or in which the time for filing an appeal has expired prior to November 8, 1984. However if the application contains allowed claims on or after November 8, 1984, the allowed claims are subject to amended §103.

(3) The amendment to §103 will be applied to any application (a) which is before the examiner for action and in which all the claims hav not been allowed and the prosecution closed or (b) in which prosecution has been closed and is being reopened to reject the allowed claims on grounds other than §102(f)/103 or §102(g)/103.

(4) Applications not before the examiner for action, e.g., an application in which a response from applicant is required, will *not* be considered as to the applicability of amended §103 unless applicant takes timely action which properly requires an action on the merits by the examiner.

B. *Conflicting Co-pending Applications Of Different Inventive Entities With No Indication That They Are Commonly Owned*

(1) If the application files do not establish that they are owned by, or subject to an obligation of assignment to, the same person, the examiner will:

(a) assume that the applications are not commonly owned;

(b) examine the applications on all grounds other than any conflict between the applications;

(c) consider the applicability of §102(f)/103 or § 102(g)/103 if one application refers to the other (if there is no cross-reference between the applications it would be inappropriate for the examiner to refer to one application in the other in view of 35 U.S.C. 122);

(d) consider interference if appropriate;

(e) suspend the later filed application if it is otherwise allowable until the earlier filed application is abandoned or issues as a patent and then reject the later filed application under § 102(e)/103, if appropriate; and

(f) proceed under item C below if at any time during the examination a statement is made that the applications are commonly owned.

C. *Conflicting Co-pending Applications Of Different Inventive Entities Which Are Commonly Owned*

(1) Co-pending applications will be considered by the examiner to be owned by, or subject to an obligation of assignment to, the same person if (a) the application files refer to assignments recorded in the PTO in accordance with 37 CFR 1.331 which convey the entire rights in the applications to the same person(s) or organization(s); or (b) copies of unrecorded assignments which convey the entire rights in the applications to the same person(s) or organization(s) are filed in each of the applications; or (c) an affidavit or declaration by the common owner is filed which states that there is common ownership and explains why the affiant believes there is common ownership; or (d) other evidence is submitted which establishes common ownership of the applications in question, e.g., a court decision determining the owner. In circumstances where the common owner is a corporation or other organization an affidavit or declaration averring common ownership may be signed by an official of the corporation or organization empowered to act on behalf of the corporation or organization.

(2) If the application files establish that they are owned by, or subject to an obligation of assignment to, the same person, the examiner will:

(a) examine the applications as to all grounds except §§102(f) and (g) as they apply through §103 if the application files establish common ownership at the time the later invention was made;

(b) examine the applications for double patenting, including double patenting of the

obviousness type, and make a provisional rejection, if appropriate, (see *In re Mott*, 190 USPQ 536 (CCPA 1976);

(c) examine the later filed application under §102(e) as it applies through §103 and make a provisional rejection under §102(e)/103 in the later filed application, if appropriate;

(d) permit applicant of the later filed application to file an affidavit under 37 CFR 1.131 to overcome the provisional or actual §102(e)/103 rejection, if appropriate, and a terminal disclaimer to overcome the provisional or actual rejection on double patenting of the obviousness type.

Initial Guidelines As To Implementation Of 35 U.S.C. 116

Public Law 98–622 amended 35 U.S.C. 116 to clarify that each inventor need not "sign the application" in addition to making the required oath and to add a new sentence which reads as follows:

"Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent."

The significant features resulting from these amendments to §116 are the following:

(1) The joint inventors do not have to separately "sign the application," but only need apply for the patent jointly and make the required oath by signing the same; this is a clarification, but not a change in current practice.

(2) Inventors may apply for a patent jointly even though "they did not work together or at the same time," thereby clarifying (a) that it is not necessary that the inventors physically work together on a project, and (b) that one inventor may "take a step at one time, the other an approach at different times." (*Monsanto Co.* v. *Kamp*, 154 USPQ 259 (D.D.C. 1967)).

(3) Inventors may apply for a patent jointly even though "each did not make the same type or amount of contribution," thereby clarifying the "fact that each of the inventors plays a different role and that the contribution of one may not be as great as that of another does not detract from the fact that the invention is joint, if each makes some original contribution, though partial, to the final solution of the problem." *Monsanto*, supra.

(4) Inventors may apply for a patent jointly even though "each did not make a contribution to the subject matter of every claim of the patent."

(5) Inventors may apply for a patent jointly as long as each inventor made a contribution, i.e., was an inventor or joint inventor, of the subject matter of at least one claim of the patent; there is no requirement that all the inventors be joint inventors of the subject matter of any one claim.

(6) If an application by joint inventors includes more than one independent and distinct invention, restriction may be required with the possible result of a necessity to change the inventorship named in the application if the elected invention was not the invention of all the originally named inventors.

(7) The amendment to §116 increases the likelihood that different claims of an application or patent may have different dates of invention; when necessary the Office or court may inquire of the patent applicant or owner concerning the inventors and the invention dates for the subject matter of the various claims.

Implementation Steps As To Amended 35 U.S.C. 116

(1) See items (1) to (4) above under "Applications To Be Considered" for applications to be considered under amended §116.

(2) Pending applications will be permitted to be amended by complying with 37 CFR 1.48 to add claims to inventions by inventors not named when the application was filed as long as such inventions were disclosed in the application as filed since 37 CFR 1.48 permits correction of inventorship where the "correct inventor or inventors are not named in an application for patent through error without any deceptive intention on the part of the actual inventor or inventors".

(3) Under amended §116 an examiner will reject claims under §102(f) only in circumstances where a named inventor is not the inventor of at least one claim in the application; no rejection under §102(f) is appropriate if a named inventor made a contribution to the invention defined in any claim of the application.

(4) Under amended §116 considered in conjunction with amended §103, a rejection may be appropriate under §102(f)/103 where the subject matter, i.e., prior art, and the claimed invention were not owned by, or subject to an obligation of assignment to, the same person at the time the invention was made.

(5) Applicants are responsible for correcting, and will be required to correct, the inventorship in compliance with 37 CFR 1.48 when the application is amended to change the claims so that one (or more) of the named inventors is no longer an inventor of the subject matter of a claim remaining in the application.

(6) In requiring restriction in an application filed by joint inventors the examiner will remind applicants of the necessity to correct the inventorship pursuant to 37 CFR 1.48 if an invention is elected and the claims to the invention of one or more inventors are cancelled.

(7) The examiner will not inquire of the patent applicant concerning the inventors and the invention dates for the subject matter of the various claims until it becomes necessary to do so in order to properly examine the application.

(8) If an application is filed with joint inventors, the examiner will assume that the subject matter of the various claims was commonly owned at the time the inventions covered therein were made, unless there is evidence to the contrary. If inventors of subject matter, not commonly owned at the time of the later invention, file a joint application, applicants have an obligation pursuant to 37 CFR 1.56 to point out the inventor and invention dates of each claim and the lack of common ownership at the time the later invention was made in order that the examiner may consider the applicability of §102(f)/103 or §102(g)/103. The examiner will assume, unless there is evidence to the contrary, that applicants are complying with their duty of disclosure.

Initial Guidelines As To Implementation Of 35 U.S.C. 120

Public Law 98–622 amended 35 U.S.C. 120 by striking out "by the same inventor" and inserting in its place "which is filed by an inventor or inventors named in the previously filed application."

The amended first paragraph of 35 U.S.C. 120 (the bracketed portion was deleted and the underlined portion added) reads as follows:

§120. Benefit of earlier filing date in the United States

An appliction for patent for an invention disclosed in the manner provided by the first paragraph of section 112 of this title in an application previously filed in the United States, or as provided by section 363 of this title, [by the same inventor] *which is filed by an inventor or inventors named in the previously filed application* shall have the same effect, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or on an application similarly entitled to the benefit of the filing date of the first application and if it contains

or is amended to contain a specific reference to the earlier filed application."

The significant features of these amendments to §120 are the following:

(1) A later filed application by an inventor or inventors of a previously filed co-pending application may claim the benefit of the previously filed co-pending application under §120 even though the later filed application does not name all of the same inventors as the previously filed application.

(2) In order for the later filed application to be entitled to claim the benefit of the earlier filed co-pending application under §120 the earlier filed co-pending application must
   (a) have at least one inventor in common with the later filed application; and
   (b) disclose the common inventor's invention in the manner provided by the first paragraph of 35 U.S.C. 112, i.e., fully disclose and support at least one of the common inventor's claims found in the later application.

(3) When necessary the Patent and Trademark Office or a court may inquire of the patent applicant or owner as to who invented, and the date of invention of, the subject matter being claimed in any claims in the later filed application.

(4) Double patenting rejections may be applicable, whether or not the applications and patents are commonly owned as long as the applications/patent(s) have at least one inventor in common.

(5) If the applications and patents are commonly owned, the rejection of the applications on the grounds of double patenting can be overcome by an appropriate terminal disclaimer as long as the identical invention is not being claimed. See *In re Robeson,* 141 USPQ 485 (CCPA 1964), and *In re Kaye,* 141 USPQ 829 (CCPA 1964).

(6) If the applications and patents are not commonly owned, the double patenting rejection is entered in the later filed application and cannot be overcome by a terminal disclaimer since the ownership of the subject matter being claimed belongs to someone other than the owner of the later application.

Implementation Steps As To Amended 35 U.S.C. 120

(1) See items (1) to (4) above under "Applications To Be Considered" for applications to be considered under amended §120.

(2) The examiner will examine any earlier filed co-pending application to which priority is claimed under §120 to determine if
   (a) the earlier filed co-pending application has at least one inventor in common with the later filed application;
   (b) the other requirements for claiming benefit under §120 are met; and
   (c) a rejection on the grounds of double patenting is proper.

(3) As long as the formal requirements for claiming benefit under §120 are met, the examiner will permit the claim to be made without examining the earlier filed co-pending application for disclosure and support of at least one claim of the later filed application under the first paragraph of §112 unless it becomes necessary to do so, e.g. because of an interference or an intervening reference.

(4) The examiner will not inquire of the patent applicant as to who invented, and the date of invention of, the subject matter being claimed in any claims in the later filed application until it becomes necessary to do so in order to properly examine the application.

(5) The examiner will examine the earlier and later filed applications and make actual or provisional rejections for double patenting where appropriate, whether or not the applications are commonly owned.

Example 1 - Single Application - Plural Inventors

Inventors A and B, both employees of Company E with obligation to assign all their inventions to E develop inventions X and Y respectively. An application for patent is properly filed listing A and B as joint inventors and with claims to both X and Y as now possible under §116 as amended by Public Law 98-622.

Situation 1.

The claims to X and Y are not patentably distinct.

Examiner's Action:

If otherwise patentable over the prior art—allows application.

Situation 2.

The claims to X and Y are patentably distinct.

Examiner's Action:

Require restriction and election of claims to either X or Y. The applicant, after election, must correct the inventorship of the application to list only the inventor of the elected invention; for example, inventor A if claims to invention X were elected. A divisional application with B as inventor and claims to Y may claim benefit of the originally filed application under 35 U.S.C. 120 as amended by Public Law 98-622.

Situation 3.

The application contains a Markush-type claim to X and Y and separate species claims to X and Y.

Examiner's Action:

(a) Examine the application to determine if the inventions X and Y are restrictable. If so, the claims to elected invention X (assume X is elected by applicants) and the X portion of the Markush claim to X and Y are examined.
   (i) if the claim to X is allowable, the entire Markush claim and the species claim to Y must also be examined.
   (ii) if the claim to X is *not* allowable, no further action on species claim Y or the Y portion of the Markush claim is required.

The inventorship of the application at the time of allowance must be corrected, if necessary, to correspond to the inventions covered by the claims allowed.

Example 2 - Multiple applications - plural inventions

Inventors A and B, both employees of Company E, with obligation to assign all their inventions to E, develop inventions X and Y with Y being developed by B after knowledge of A's development of X. A files application on X before B's development of Y and B later files application. Both applications establish they are owned by Company E.

Situation 1.

The claims to X and Y are not patentably distinct.

Examiner's Action:

(a) Examine the applications as to all grounds except §102(f) and (g) as they apply through §103;

(b) Make a provisional rejection of the later filed application on the grounds of double patenting of the obviousness type, if appropriate. If a terminal disclaimer is filed in accordance with §1.321(b), the provisional double patenting rejection of the obviousness type will be overcome;

(c) Examine the later filed application under §102(e)/103 and make a provisional rejection based on §102(e)/103, if appropriate. An affidavit under §1.131 can be filed to overcome the rejection based on §102(e)/103.

Situation 2.

After receiving the examiner's action in situation 1, A and B filed a continuation-in-part application with inventor C and claim A's invention, B's invention and an im-

provement they jointly developed with C. A and B abandon their prior applications.

Examiner's Action:
Examine the application in the normal manner; no double patenting and §102(e)/103 problems now exist.

Example 3 - Two copending applications with no indication in the record of common ownership

Inventor A files an application with claims to invention X. Another copending application is filed by inventor B claiming invention Y. There is no indication of common ownership.

Situation 1.
The claims in the two applications are directed to patentably distinct inventions.

Examiner's Action:
If the claims are otherwise allowable, the applications are both allowed.

Situation 2.
The claims in the two applications are *not* patentably distinct.

Examiner's Action:
The applications are prosecuted until one application is allowable. If the time difference between the two applications is too large to declare an interference, action on the later filed application is suspended until the earlier filed application issues as a patent. At that time the later filed application is rejected over the earlier filed application under §102(e)/103.

If the filing dates of the applications are sufficiently close to declare an interference, claims for an interference should be suggested. If the applications are commonly owned, the common owner must make the ownership known. When such common ownership is made known, a provisional double patenting rejection should be made in the later filed application. If the double patenting rejection is of the obviousness type, a terminal disclaimer under 37 CFR 1.321(b) may be filed. The later filed application should be examined under §102(e)/103 and a provisional rejection based on §102(e)/103 should be made in the later filed application, if appropriate. An affidavit under §1.131 can be filed to overcome a rejection based on §102(e)/103.

Example 4 - Claims in single application by different inventors.

An application for patent is filed in the Patent and Trademark Office in which the owner E sets forth the following information.

"The subject matter of claim 1 was invented by inventor A. The subject matter of claim 2 was invented by inventor B. Inventor B knew of the invention of inventor A at the time he made his invention. Both A and B made their inventions while working for owner E with a duty to assign". The inventions are different but not patentably distinct.

Examiner's Action:
If the claims are patentable over the prior art, the application should be allowed.

Public Law 98-622
Signed November 8, 1984

Ninety-eighth Congress of the United States of America

AT THE SECOND SESSION

Begun and held at the City of Washington on Monday, the twenty-third day of January, one thousand nine hundred and eighty-four

An Act

To amend title 35, United States Code, to increase the effectiveness of the patent laws, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the "Patent Law Amendments Act of 1984".

TITLE I—PATENT IMPROVEMENT PROVISIONS

USE OF PATENTED INVENTIONS OUTSIDE THE UNITED STATES

SEC. 101.(a) Section 271 of title 35, United States Code, is amended by adding at the end thereof the following new subsection:

"(f)(1) Whoever without authority supplies or causes to be supplied in or from the United States all or a substantial portion of the components of a patented invention, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer.

"(2) Whoever without authority supplies or causes to be supplied in or from the United States any component of a patented invention that is especially made or especially adapted for use in the invention and not a staple article or commodity of commerce suitable for substantial noninfringing use, where such component is uncombined in whole or in part, knowing that such component is so made or adapted and intending that such component will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer."

STATUTORY INVENTION REGISTRATION

SEC. 102.(a) Chapter 14 of title 35, United States Code, is amended by adding at the end thereof the following new section:

"§157. Statutory invention registration

"(a) Notwithstanding any other provision of this title, the Commissioner is authorized to publish a statutory invention registration containing the specification and drawings of a regularly filed application for a patent without examination if the applicant-

"(1) meets the requirements of section 112 of this title;

"(2) has complied with the requirements for printing, as set forth in regulations of the Commissioner;

"(3) waives the right to receive a patent on the invention within such period as may be prescribed by the Commissioner; and

"(4) pays application, publication, and other processing fees established by the Commissioner.

If an interference is declared with respect to such an application, a statutory invention registration may not be published unless the issue of priority of invention is finally determined in favor of the applicant.

"(b) The waiver under subsection (a)(3) of this section by an applicant shall take effect upon publication of the statutory invention registration.

"(c) A statutory invention registration published pursuant to this section shall have all of the attributes specified for patents in this title except those specified in section 183 and sections 271 through 289 of this title. A statutory invention registration shall not have any of the attributes specified for patents in any other provision of

law other than this title. A statutory invention registration published pursuant to this section shall give appropriate notice to the public, pursuant to regulations which the Commissioner shall issue, of the preceding provisions of this subsection. The invention with respect to which a statutory invention certificate is published is not a patented invention for purposes of section 292 of this title.

"(d) The Secretary of Commerce shall report to the Congress annually on the use of statutory invention registrations. Such report shall include an assessment of the degree to which agencies of the Federal Government are making use of the statutory invention registration system, the degree to which it aids the management of federally developed technology, and an assessment of the cost savings to the Federal Government of the use of such procedures.".

(b) The table of sections at the beginning of chapter 14 of title 35, United States Code, is amended by adding at the end thereof the following:

"157. Statutory invention registration.".

(c) The amendments made by this section shall take effect six months after the date of the enactment of this Act.

PRIOR ART

SEC. 103. Section 103 of title 35, United States Code, is amended by adding at the end thereof the following:

"Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.".

JOINT INVENTORS

SEC. 104. (a) Section 116 of title 35, United States Code, is amended by amending the first paragraph to read as follows:

"When an invention is made by two or more persons jointly, they shall apply for patent jointly and each make the required oath, except as otherwise provided in this title. Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent.".

(b) Section 120 of title 35, United States Code, is amended by striking out "by the same inventor" and inserting in lieu thereof "which is filed by an inventor or inventors named in the previously filed application".

ARBITRATION OF INTERFERENCES

SEC. 105. Section 135 of title 35, United States Code, is amended by adding at the end thereof the following new subsection:

"(d) Parties to a patent interference, within such time as may be specified by the Commissioner by regulation, may determine such contest or any aspect thereof by arbitration. Such arbitration shall be governed by the provisions of title 9 to the extent such title is not inconsistent with this section. The parties shall give notice of any arbitration award to the Commissioner, and such award shall, as between the parties to the arbitration, be dispositive of the issues to which it relates. The arbitration award shall be unenforceable until such notice is given. Nothing in this subsection shall preclude the Commissioner from determining patentability of the invention involved in the interference.".

EFFECTIVE DATE

SEC. 106. (a) Subject to subsections (b), (c), (d), and (e) of this section, the amendments made by this Act shall apply to all United States patents granted before, on, or after the date of enactment of this Act, and to all applications for United States patents pending on or filed after the date of enactment.

(b) The amendments made by this Act shall not affect any final decision made by the court or the Patent and Tradem athe date of enactment of this Act with respect to a patent or application for patent, if no appeal from such decision is pending and the time for filing an appeal has expired.

(c) Section 271(f) of title 35, United States Code, added by section 101 of this Act shall apply only to the supplying, or causing to be supplied, of any component or components of a patented invention after the date of enactment of this Act.

(d) No United States patent granted before the date of enactment of this Act shall abridge or affect the right of any person or his successors in business who made, purchased, or used prior to such effective date anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used, if the patent claims were invalid or otherwise unenforceable on a ground obviated by section 103 or 104 of this Act and the person made, purchased, or used the specific thing in reasonable reliance on such invalidity or unenforceability. If a person reasonably relied on such invalidity or unenforceability, the court before which such matter is in question may provide for the continued manufacture, use, or sale of the thing made, purchased, or used as specified, or for the manufacture, use, or sale of which substantial preparation was made before the date of enactment of this Act, and it may also provide for the continued practice of any process practiced, or for the practice of which substantial preparation was made, prior to the date of enactment, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced before the date of enactment.

(e) The amendments made by this Act shall not affect the right of any party in any case pending in court on the date of enactment to have their rights determined on the basis of the substantive law in effect prior to the date of enactment.

TITLE II—PATENT AND TRADEMARK OFFICE PROCEDURES

BOARD OF PATENT APPEALS AND INTERFERENCES

SEC. 201. (a) Section 7 of title 35, United States Code, is amended to read as follows:

"§7. Board of Patent Appeals and Interferences

"(a) The examiners-in-chief shall be persons of competent legal knowledge and scientific ability, who shall be appointed to the competitive service. The Commissioner, the Deputy Commissioner, the Assistant Commissioners, and the examiners-in-chief shall constitute the Board of Patent Appeals and Interferences.

"(b) The Board of Patent Appeals and Interferences shall, on written appeal of an applicant, review adverse decisions of examiners upon applications for patents and shall determine priority and patentability of invention in interferences declared under section 135(a) of this title. Each appeal and interference shall be heard by at least three members of the Board of Patent Appeals and Interferences, who shall be designated by the Commissioner. Only the Board of Patent Appeals and Interferences has the authority to grant hearings.

"(c) Whenever the Commissioner considers it necessary, in order to keep current the work of the Board of Patent Apeals and Interferences, the Commissioner may

designate any patent examiner of the primary examiner grade or higher, having the requisite ability, to serve as examiner-in-chief for periods not exceeding six months each. An examiner so designated shall be qualified to act as a member of the Board of Patent Appeals and Interferences. Not more than one of the members of the Board of Patent Appeals and Interferences hearing an appeal or determining an interference may be an examiner so designated. The Secretary of Commerce is authorized to fix the pay of each designated examiner-in-chief in the Patent and Trademark Office at not to exceed the maxium rate of basic pay payable for grade GS-16 of the General Schedule under section 5332 of title 5. The rate of basic pay of each individual designated examiner-in-chief shall be adjusted, at the close of the period for which that individual was designated to act as examiner-in-chief, to the rate of basic pay which that individual would have been receiving at the close of such period if such designation had not been made.".

(b) The item relating to section 7 in the table of sections at the beginning of chapter 1 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

INTERFERENCES

SEC. 202. Section 135(a) of title 35, United States Code, is amended to read as follows:

"(a) Whenever an application is made for a patent which, in the opinion of the Commissioner, would interfere with any pending application, or with any unexpired patent, an interference may be declared and the Commissioner shall give notice of such declaration to the applicants, or applicant and patentee, as the case may be. The Board of Patent Appeals and Interferences shall determine questions of priority of the inventions and may determine questions of patentability. Any final decision, if adverse to the claim of an applicant, shall constitute the final refusal by the Patent and Trademark Office of the claims involved, and the Commissioner may issue a patent to the applicant who is adjudged the prior inventor. A final judgment adverse to a patentee from which no appeal or other review has been or can be taken or had shall constitute cancellation of the claims involved in the patent, and notice of such cancellation shall be endorsed on copies of the patent distributed after such cancellation by the Patent and Trademark Office.".

APPEALS AND CIVIL ACTIONS

SEC. 203. (a) Section 141 of title 35, United States Code, is amended—

(1) in the first sentence—

(A) by striking out "of the Board of Patent Appeals may appeal" and inserting in lieu thereof "in an appeal to the Board of Patent Appeals and Interferences under section 134 of this title may appeal the decision"; and

(B) by striking out ", thereby waiving his right" and inserting in lieu thereof ". By filing such an appeal the applicant waives his or her right";

(2) in the second sentence—

(A) by striking out "board of patent interferences on the question of priority may appeal" and inserting in lieu thereof "Board of Patent Appeals and Interferences on the interference may appeal the decision";

(B) by striking out "according to" and inserting in lieu thereof " in accordance with"; and

(C) by striking out "he" and inserting in lieu thereof "the party"; and

(3) by amending the last sentence to read as follows: "If the appellant does not, within thirty days after the filing of such notice by the adverse party, file a civil action under section 146, the decision appealed from shall govern the further proceedings in the case."

(b) Section 145 of title 35, United States Code, is amended—

(1) in the first sentence by striking out "Appeals may" and inserting in lieu thereof "Patent Appeals and Interferences in an appeal under section 134 of this title may,"; and

(2) in the second sentence by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

(c) Section 146 of title 35, United States Code, is amended by striking out "board of patent intereferences on the question of priority" and inserting in lieu thereof "Board of Patent Appeals and Interferences on the interference".

TECHNICAL AND CONFORMING AMENDMENTS

SEC. 204. (a) Section 41(a)(6) of title 35, United States Code, is amended—

(1) by striking out "Appeals" each place it appears and inserting in lieu thereof "Patent Appeals and Interferences"; and

(2) by inserting "in the appeal" after "oral hearing".

(b)(1) Section 134 of title 35, United States Code, is amended—

(A) in the section caption by striking out "APPEALS" and inserting in lieu thereof "PATENT APPEALS AND INTERFERENCES"; and

(B) by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

(2) The item relating to section 134 in the table of sections at the beginning of chapter 12 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

(c) Section 305 of title 35, United States Code, is amended by striking out "Appeals" and inserting in lieu thereof "Patent Appeals and Interferences".

AMENDMENTS TO OTHER PROVISIONS OF LAW

SEC. 205. (a) Section 1295(a)(4)(A) of title 28, United States code, is amended by striking out "Appeals or the Board of Patent" and inserting in lieu thereof "Patent Appeals and".

(b) Section 152 of the Atomic Energy Act of 1954 (42 U.S.C. 2182) is amended in the third paragraph—

(1) by striking out "a Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences"; and

(2) by striking out "the Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

(c)(1) Section 305(d) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457(d)) is amended—

(A) by striking out "a Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences"; and

(B) by striking out "the Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

(2) Section 305(e) of the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457(e)) is amended by striking out "a Board of Patent Interferences" and inserting in lieu thereof "the Board of Patent Appeals and Interferences".

SAVINGS PROVISION

SEC. 206. Any individual who, on the effective date of this title, is an examiner-in-chief of the Board of Patent Appeals of the Patent and Trademark Office or an examiner of interferences of the Board of Patent Interferences of such office shall be entitled to continue in office as a member of the Board of Patent Appeals and Interferences of the Patent and Trademark Office as of such effective date.

EFFECTIVE DATE

SEC. 207. Section 206 of this Act and the amendments made by this title shall take effect three months after the date of the enactment of this Act.

TITLE III—NATIONAL COMMISSION ON INNOVATION AND PRODUCTIVITY

ESTABLISHMENT

SEC. 301. There is hereby established a National Commission on Innovation and Productivity (hereinafter in this title referred to as the "Commission").

MEMBERSHIP OF COMMISSION

Sec. 302. (a) The Commission shall be composed of —

(1) three Members of the Senate appointed by the President of the Senate;

(2) three Members of the House of Representatives apointed by the Speaker of the House of Representatives; and

(3) three members appointed by the President of the United States, one of whom the President shall designate as Chairman.

Of the members appointed by the President, one member should be an appropriate officer or employee of the United States, one member should be an employer who employs inventors, and one member should be an employed inventor.

(b) At no time shall more than two of the members appointed under paragraph (1), (2), or (3) of subsection (a) be persons who are members of the same political party.

(c) Any vacancy in the Commission shall not affect its powers but shall be filled in the same manner in which the original appointment was made, and subject to the limimtation set forth in subsection (b) with respect to the original appointment.

(d) Six members of the Commission shall constitute a quorum, but a lesser number may conduct hearings.

DUTIES OF THE COMMISSION

SEC. 303. The Commission shall make a full and complete review and study of the level of innovation and producitivity of employed inventors. Such study shall include an analysis of the various methods available to inspire or stimulate individual and corporate innovation and productivity, including an assessment of the techniques used in other countries to achieve this objective. Such study may include an assessment of those aspects of other areas of intellectual property law that inspire or stimulate such innovation and productivity. The Commission shall make recomendations for such revisions of the laws of the United States, including the repeal of unnecessary or undesirable statutes, and such other changes as the Commission considers will better foster innovation and productivity.

COMPENSATION OF MEMBERS OF THE COMMISSION

SEC. 304. (a) A member of the Commission who is a Member of Congress or a full-time officer or employee of the United States shall receive no additional compensation by reason of his or her service on the Commission.

(b) Subject to amounts provided in advance in appropriations Acts, a member of the Commission from private life shall receive the daily equivalent of the annual rate of basic pay payable for level III of the Executive Schedule for each day (including traveltime) during which such member is engaged in the actual performance of duties vested in the Commission, plus reimbursement for travel, subsistence, and other necessary expenses incurred in the performance of such duties, in accordance with subchapter I of chapter 57 of title 5, United States Code.

DIRECTOR AND STAFF

SEC. 305. (a) The Commission shall have a Director who shall be appointed by the Commission and who shall be paid at a rate not to exceed the rate of basic pay payable for level IV of the Executive Schedule. The Director, subject to the direction of the Commission, shall supervise the activities of persons emloyed by the Commission and the preparation of the reports of the Commission and shall perform such other duties as may be assigned to the Director by the Commission.

(b) The Commission may appoint and fix the pay of such additional personnel as it considers appropriate.

(c) The staff of the Commission may be appointed without regard to the provisions of title 5, United States Code, governing appointments in the competitive service, and may be paid without regard to the provisions of chapter 51 and subchapter III of chapter 53 of such title relating to classification and General Schedule pay rates, except that no individual so appointed may receive pay in excess of the maximum annual rate of basic pay payable for GS-16 of the General Schedule.

(d) The Chairman of the Commission may procure temporary and intermittent services under section 3109(b) of title 5, United States Code.

GOVERNMENT AGENCY COOPERATION

SEC. 306. The Commission is authorized to request from any department, agency, or independent instrumentality of the Government any information and assistance it considers necessary to carry out its functions under this title. Each such department, agency, and instrumentality is authorized to cooperate with the Commission and, to the extent permitted by law, to furnish such information and assistance to the Commission.

REPORT OF THE COMMISSION; TERMINATION

SEC. 307. The Commission shall submit interim reports on its activities to the President and the Congress at such times as the Commission considers appropriate, except that at least one such report shall be so submitted within one year after the date of the enactment of this Act. The Commission shall submit its final report on its activities to the President and the Congress within two years after such date of enactment. The Commission shall cease to exist sixty days after the date of the submission of its final report.

ADMINISTRATIVE SERVICES

SEC. 308. The General Services Administration shall provide administrative services for the Commission on a reimbursable basis.

AUTHORIZATION OF APPROPRIATIONS

SEC. 309. There is authorized to be appropriated $250,000 to carry out this title.

EFFECTIVE DATE

SEC. 310. This title shall take effect on January 21, 1985.

TITLE IV—MISCELLANEOUS PROVISIONS

INTERNATIONAL STAGE

SEC. 401. (a) Section 361(d) of title 35, United States Code, is amended in the first sentence by inserting "or within one month after the date of such filing" after "application".

(b) Section 366 of title 35, United States Code, is amended—

(1) in the first sentence—

(A) by inserting "after the date of withdrawal," after "effect"; and

(B) by inserting before the period the following: ", unless a claim for the benefit of a prior filing date under section 365(c) of this part was made in a national application, or an international application designating the United States, filed before the date of such withdrawal"; and

(2) in the second sentence by inserting "withdrawn" after "such".

NATIONAL STAGE

SEC. 402. (a) Section 371(a) of title 35, United States Code, is amended—

(1) by striking out "is" and inserting in lieu thereof "may be"; and

(2) by striking out", except those filed in the Patent Office".

(b) Section 371(b) of title 35, United States Code, is amended to read as follows:

"(b) Subject to subsection (f) of this section, the national stage shall commence with the expiration of the applicable time limit under article 22(1) or (2) of the treaty.".

(c) Section 371(c)(2) of title 35, United States Code, is amended—

(1) by striking out "received from" and inserting in lieu thereof "communicated by"; and

(2) by striking out "verified" before "translation".

(d) Section 371(d) of title 35, United States Code, is amended to read as follows:

"(d) The requirements with respect to the national fee referred to in subsection (c)(1), the translation referred to in subsection (c)(2), and the oath or declaration referred to in subsection (c)(4) of this section shall be complied with by the date of the commencement of the national stage or by such later time as may be fixed by the Commissioner. The copy of the international application referred to in subsection (c)(2) shall be submitted by the date of the commencement of the national stage. Failure to comply with these requirements shall be regarded as abandonment of the application by the parties thereof, unless it be shown to the satisfaction of the Commissioner that such failure to comply was unavoidable. The payment of a surcharge may be required as a condition of accepting the national fee referred to in subsection (c)(1) or the oath or declaration referred to in subsection (c)(4) of this section if these requirements are not met by the date of the commencement of the national stage. The requirements of subsection (c)(3) of this section shall be complied with by the date of the commencement of the national stage, and failure to do so shall be regarded as a cancellation of the amendments to the claims in the international application made under article 19 of the treaty.".

(e) Section 372(b) of title 35, United States Code, is amended—

(1) by striking out the period at the end of paragraph (2) and inserting in lieu thereof "; and"; and

(2) by adding at the end thereof the following:

"(3) the Commissioner may require a verification of the translation of the international application or any other document pertaining to the application if the application or other document was filed in a language other than English.".

(f) Section 372 of title 35, United States Code, is amended by striking out subsection (c).

(g) Section 376(a) of title 35, United States Code, is amended by striking out paragraph (5) and redesignating paragraph (6) as paragraph (5).

TECHNICAL AMENDMENTS

SEC. 403. (a) Title 35, United States Code, is amended by striking out "Patent Office" each place it appears and inserting in lieu thereof "Patent and Trademark Office".

(b) The table of parts at the beginning of title 35, United States Code, is amended by adding at the end thereof the following:

"IV. Patent Cooperation Treaty ..... 351".

PATENT FEES

SEC. 404. (a) Notwithstanding section 41 of title 35, United States Code, as in effect before the enactment of Public Law 97–247 (96 Stat. 317), no fee shall be collected for maintaining a plant patent in force.

(b) Notwithstanding section 41(c) of title 35, United States Code, as in effect before the enactment of Public Law 97–247 (96 Stat. 317), the Commissioner of Patents and Trademarks may accept, after the six-month grace period referred to in such section 41(c), the payment of any maintenance fee due on any patent based on an application filed in the Patent and Trademark Office on or after December 12, 1980, and before August 27, 1982, to the same extent as in the case of patents based on applications filed in the Patent and Trademark Office on or after August 27, 1982.

TRADEMARK TRIAL AND APPEAL BOARD

SEC. 405. Section 3 of title 35, United States Code, is amended by adding at the end thereof the following:

"(e) The members of the Trademark Trial and Appeal Board of the Patent and Trademark Office shall each be paid at a rate not to exceed the maximum rate of basic pay payable for GS–16 of the General Schedule under section 5332 of title 5."

EFFECTIVE DATE

SEC. 406. (a) Section 404 of this Act and the amendments made by section 403 of this Act shall take effect on the date of the enactment of this Act.

(b) The amendments made by sections 401, 402, and 405 of this Act shall take effect six months after the date of the enactment of this Act.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 8, 1985

4,310,754	4,436,371	4,458,036	4,464,913
4,346,227	4,436,596	4,458,073	4,464,984
4,349,924	4,437,151	4,458,447	4,465,059
4,366,165	4,437,363	4,458,993	4,465,400
4,367,346	4,439,343	4,458,996	4,465,454
4,371,938	4,440,845	4,459,428	4,465,577
4,394,954	4,442,786	4,459,503	4,465,699
4,406,289	4,443,236	4,459,679	4,465,701
4,407,818	4,443,452	4,459,900	4,465,708
4,412,098	4,444,036	4,461,000	4,465,892
4,414,269	4,444,684	4,462,227	4,466,073
4,415,221	4,446,518	4,462,277	4,466,539
4,419,530	4,447,434	4,462,543	4,466,826
4,420,409	4,447,440	4,462,865	4,466,917
4,423,054	4,450,796	4,463,022	4,467,075
4,423,095	4,451,782	4,463,289	4,467,079
4,424,316	4,452,218	4,463,704	4,467,080
4,425,528	4,452,241	4,463,707	4,467,287
4,428,448	4,452,603	4,463,775	4,467,431
4,431,268	4,456,358	4,463,938	4,467,588
4,431,753	4,456,622	4,464,064	4,467,600
4,434,444	4,456,957	4,464,112	4,468,097
4,434,661	4,457,459	4,464,395	4,468,210
4,435,449	4,457,828	4,464,554	4,468,480

Disclaimers

4,443,440.—*Bradley D. Anderson,* Kalamazoo; and *Robert A. Conradi,* Portage, Mich. AMINE CONTAINING ESTER PRODRUGS OF CORTICOSTEROIDS. Patent dated Apr. 17, 1984. Disclaimer filed June 22, 1984, by the assignee, *the Upjohn Co.*

Hereby enters this disclaimer to claims 1 through 12 of said patent.

4,365,656.—*Yuji Takahashi,* Hatano, Japan. IRONLESS ROTOR WINDING FOR ELECTRIC MOTOR, METHOD AND MACHINE FOR MAKING THE SAME. Patent dated Dec. 28, 1982. Disclaimer filed Nov. 3, 1983, by *the inventor.*

The term of this patent subsequent to Mar. 16, 1999, has been disclaimed.

4,007,496.—*Richard Glabiszewski,* Duderstadt, Germany. CONNECTION BETWEEN A COSMETIC COVER AND A PROSTHETIC PART. Patent dated Feb. 15, 1977. Disclaimer filed Aug. 29, 1983 by the assignee, *Otto Bock Orthopadische Industrie KG.*

Hereby enters this disclaimer to claims 1 through 4 of said patent.

Disclaimers and Dedications

Re. 27,701.—*Adrian R. Allan, Jr.,* Washington, N.C., and *Martin R. Fink,* Remsenburg, N.Y. FILTER FRAME SEAL. Patent dated July 17, 1973. Disclaimer and Dedication filed July 30, 1984, by the assignee, *Flanders Filters, Inc.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

3,774,589.—*Frederick P. Kober,* Bayside, N.Y. SELF CONTAINED ELECTROCHEMICAL HEAT SOURCE. Patent dated Nov. 27, 1973. Disclaimer and Dedication filed June 23, 1983, by the assignee, *Chem-E-Watt Corp.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

4,372,227.—*Dennis F. Mahoney,* Three Bridges; *Alfred E. Kober,* Bridgewater, N.J.; and *Subhash H. Risbud,* Champaign, Ill. METHOD OF REDUCING HIGH TEMPERATURE SLAGGING IN FURNACES. Patent dated Feb. 8, 1983. Disclaimer and Dedication filed Aug. 24, 1983, by the assignee, *Economics Laboratory, Inc.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: University of Massachusetts Library	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF December 1, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	8-20-81
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-29-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	3-25-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	8-14-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—B. R. GRAY, Director	12-06-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	9-02-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-08-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	2-16-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	10-24-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-12-80
DESIGN, GROUP 290—K. L. CAGE, Director	9-20-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—(Vacant)	7-23-81
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-16-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	9-27-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-05-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	12-04-81

Expiration of patents: The patents within the range of numbers indicated below expire during December 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,355,744 to 3,360,799, inclusive

Plant Patents ..... Numbers 2,781 to 2,783 inclusive

REISSUES

JANUARY 8, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

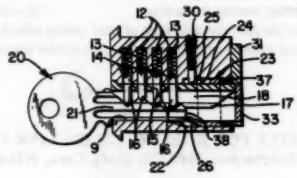
Re. 31,791
PICK-PROOF LOCK

Harry E. Dice, Sr., Edgewater, Md., assignor to George K. C. Hardesty, Mayo, Md., a part interest

Original No. 4,194,379, dated Mar. 25, 1980, Ser. No. 895,708, Apr. 12, 1978. Application for reissue Dec. 2, 1980, Ser. No. 212,107

Int. Cl.³ E05B *63/00*

U.S. Cl. 70—421 **11 Claims**



6. A key operated lock cylinder comprising:

a shell having a longitudinally extending bore;

a plug rotatively mounted in said bore having a keyway including an opening for insertion of a key, said plug having a locked position and an unlocked position;

locking means for restraining said plug in said locked position, said locking means being released when a key corresponding to said locking means is fully inserted into said keyway;

a rotation-limiting pin;

restraining notch means in a labyrinth means operatively associated with said rotation limiting pin to prevent rotation of said plug to said unlocked position;

resilient means for biasing engagement of said pin and labyrinth means to normally hold said rotation limiting pin in said restraining notch means;

said corresponding key displacing the relative positions of said pin and restraining notch means longitudinally of said bore, when said key is fully inserted, so that said pin is out of said restraining notch means and said labyrinth means to allow said plug to rotate to said unlocked position;

said labyrinth means having an enlarged portion constituting said restraining notch means, a restricted end portion, and an opening, said restricted end portion being located near the opening of said labyrinth means, said enlarged portion allowing a limited rotation of said plug when said locking means is released, said restricted end portion preventing the movement of said pin out of said labyrinth means unless said plug is positioned in said locked position.

Re. 31,792
FILTER WITH AUTOMATIC CLEANING

Pierre Colomer, Chatenay-Malabry, France, assignor to Interfiltre S.A., Livarot, France

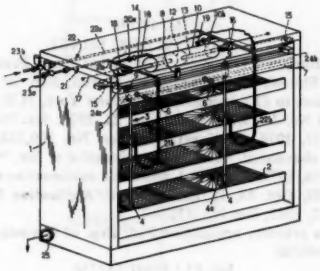
Original No. 4,285,353, dated Aug. 25, 1981, Ser. No. 75,791, Sep. 14, 1979. Application for reissue May 28, 1982, Ser. No. 383,096

Claims priority, application France, Jun. 18, 1979, 7915581

Int. Cl.³ B01D *41/00*; D01D *25/12*

U.S. Cl. 134—181 **18 Claims**

1. A system for automatic cleaning of filter panels supported by a frame comprising means for sprinkling a cleaning liquid upon the filter panels including at least one sprinkling tube having at least one outlet nozzle directed toward at least one filter panel, carriage means joined to said sprinkling means and movably mounted to said frame for movement thereon to move said sprinkling means and said outlet nozzle with respect to said filter panel, fluid driven hydraulic motor means for moving said carriage means on said frame, transmission means interconnecting said hydraulic motor means and said carriage means to transmit movement of said hydraulic motor means to said carriage means, fluid inlet means for supplying said cleaning fluid to said sprinkling tube and offtake means communicating with said fluid inlet means and said hydraulic motor means to divert a predetermined flow of said cleaning fluid to said hydraulic motor means to power said hydraulic motor means.



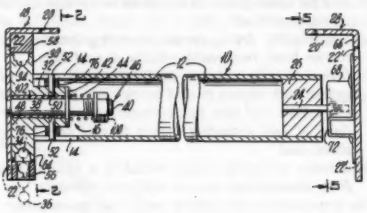
Re. 31,793
WINDOW SHADE ROLLER ASSEMBLY

Joel Berman, 1470 Hewlett Ave., Hewlett, N.Y. 11557, and Stephen D. Weinreich, Monmouth Junction, N.J., assignors to Joel Berman, Hewlett, N.Y.

Original No. 4,323,105, dated Apr. 6, 1982, Ser. No. 18,763, Mar. 8, 1979. Continuation-in-part of Ser. No. 716,153, Aug. 20, 1976, Pat. No. 4,223,714. Application for reissue Mar. 29, 1983, Ser. No. 479,948

Int. Cl.³ E06B *9/20*

U.S. Cl. 160—309 **11 Claims**



1. A window shade roll assembly comprising in combination:

a shade roll;

a first support apparatus organized at a first end of the shade roll, a second support apparatus for supporting rotatably a second end of the shade roll;

an operator system on said first support apparatus including:

a mounting plate on said first support apparatus having a pin extending therefrom axially of the shade roll and into the shade roll,

a wheel mounted rotatably about the pin on said first support apparatus and having a face arranged in juxtaposition to the mounting plate,

the wheel having a hub of a diameter smaller than the shade roll and projecting therefrom opposite the face,

means for connecting detachably the hub that is on said first support apparatus to the shade roll,

biasing means connected to the hub for causing frictional contact of the face of the wheel against the mounting plate,

and a wheel turner mechanism;

the window shade roll assembly characterized in that all of the elements of said operator system are mounted on the first support apparatus.

Re. 31,794

SPOT-TYPE DISC BRAKE

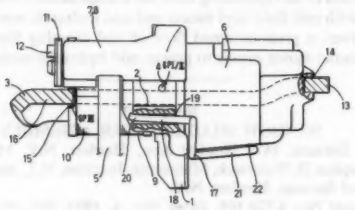
Jochen Burgdorf, Offenbach; Karl-Heinz Klose, Frankfurt, and Karl Storzel, Spreadlingen, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Original No. 3,913,709, dated Oct. 21, 1975, Ser. No. 479,934, Jun. 17, 1974. Continuation of Ser. No. 209,233, Nov. 19, 1980, abandoned, which is a continuation of Ser. No. 21,053, Mar. 16, 1979, abandoned, which is a continuation of Ser. No. 842,008, Oct. 13, 1977, abandoned. Application for reissue Mar. 7, 1983, Ser. No. 471,067

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1973, 2340316

Int. Cl.³ F16D *55/224*

U.S. Cl. 188—73.35 **9 Claims**



6. In a spot-type disc brake having

a brake disc;

a brake actuating means;

a pair of brake shoes, one of said brake shoes being disposed on one side of said disc and actuated by said actuating means, and the other of said brake shoes being disposed on the other side of said disc;

a non-rotating brake carrier receiving braking torque, said carrier being immovable relative to said disc;

a frame or yoke element embracing said disc and movably guided with respect to said carrier in a direction toward and away from said disc, said element transmitting the actuating force of said actuating means to said other of said brake shoes; and

said brake actuating means including a housing and being in force transmitting contact with said element;

the improvement comprising only three guide points to rigidly support and movably guide said element, two of said guide points being rigidly connected to said carrier and disposed above said element to rigidly support and movably guide said element, said two of said three guide points exerting a downward force on said element and a third of said three guide points being disposed in one of said actuating means and a backing plate of said other of said brake shoes, said third of said three guide points exerting an upward force on said element; and

a single biasing spring having at least one end connected to said carrier at a point radially spaced from said two of said three guide points and said element and another portion thereof acting on one of said actuating means and said element to apply an upward component of force to hold said element without clearance against all of said three guide points;

said spring acting on said one of said actuating means and said element at a point spaced axially from all of said three guide points, said point being outside an imaginary triangle formed by imaginary lines interconnecting all of said three guide points;

said actuating means being secured to said element;

said third of said three guide points including

a recess in a backing plate of said other of said brake shoes, and

a pin formed in said element engaging said recess; and

said spring is fastened to said carrier and acts on said actuating means, said spring projecting away from said carrier and disposed under said element and said actuating means;

said spring being a wire spring having two arms fastened in holes of said carrier and a loop acting upwardly on said actuating means;

said actuating means including

a contact surface for said loop of said spring which is inclined upward toward said element in a direction away from said disc.

Re. 31,795

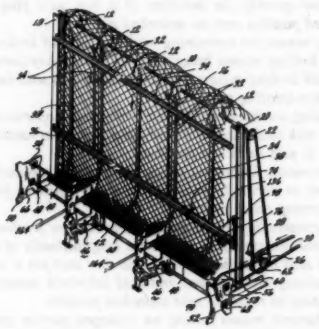
APPARATUS FOR ROLLING CHAIN LINK FENCE

Herbert E. Rohrbacher, 8695 Via Santa Cruz, Whittier, Calif. 90605

Original No. 4,353,512, dated Oct. 12, 1982, Ser. No. 224,952, Jan. 14, 1981. Application for reissue Nov. 18, 1983, Ser. No. 553,051

Int. Cl.³ B65H *75/00*; B65B *63/04*

U.S. Cl. 242—54 R **28 Claims**



1. An apparatus for rolling chain link fence including an endless belt including a free loop portion,

means supporting the endless belt and for providing movement of the endless belt in a particular direction and with the movement of the endless belt producing rotative motion in the free loop portion,

means adjacent the free loop portion of the endless belt for feeding progressive portions of the chain link fence into the free loop portion [,] *and including guide means for guiding the chain link fence in a downward path and with the guide means including a bottom portion bent away from the vertical to a more horizontal slope at the position adjacent the free loop portion of the endless belt to guide the chain link fence to a more horizontal path and to partially collapse the individual links as the chain link enters the free loop portion of the endless belt,*

the free loop portion of the endless belt and the means adjacent the free loop portion supporting the progressive portions of the chain link fence to have the individual links of the chain link fence *fully* collapse against each other to provide for a tight configuration of the chain link fence within the free loop portion, and

the rotative motion of the free loop portion of the endless belt producing a rolling of the progressive portions of the chain link fence with the individual links *fully* collapsed

against each other to form a roll of chain link fence with a tight configuration and a small diameter.

Re. 31,796

DERAILLEUR FOR BICYCLES AND SIMILAR VEHICLES

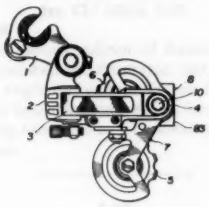
Masashi Nagano, Sakai, and Mitsuhide Isobe, Toyonaki, both of Japan, assignors to Shimano Industrial Company Limited, Osaka, Japan

Original No. 4,198,874, dated Apr. 22, 1980, Ser. No. 905,973, May 15, 1978. Application for reissue May 24, 1983, Ser. No. 497,712

Claims priority, application Japan, May 20, 1977, 52-59211; Sep. 27, 1977, 52-130393; Sep. 27, 1977, 52-130394

Int. Cl.³ F16H *9/00, 11/00*

U.S. Cl. 474—82 **12 Claims**



1. A derailleur for shifting a driving chain to one of multi-speed sprockets of a vehicle said derailleur comprising:

a base member;

a movable member movably supported to said base member,

a change-over frame pivotally supported to said movable member, said change-over frame comprising a single plate and carrying a *rotatable* tension *pulley* and a *rotatable* guide pulley [in relation of being rotable], said tension and guide pulleys having teeth in mesh with said driving chain respectively;

a chain holder *having a portion thereof on an opposite side of said driving chain with respect to said guide pulley;*

means for mounting said chain holder to said change-over frame[;

whereby] *such that* said chain holder *portion* is movable radially outward from said guide pulley with respect to said change-over frame, for disengaging said chain from said guide pulley without cutting said chain; and

means for fixing said chain holder in a position for preventing said chain from disengaging from said pulley when said chain holder is moved inward of said guide pulley.

Re. 31,797

ARC-SHIELD SUPPORTING STRUCTURE OF A VACUUM POWER INTERRUPTER

Shinzo Sakuma, Yokohama, and Junichi Warabi, Shizuoka, both of Japan, assignors to Kabushiki Kaisha Meidensha and Kabushiki Kaisha Genvac, both of Tokyo, Japan

Original No. 4,310,735, dated Jan. 12, 1982, Ser. No. 49,456, Jun. 18, 1979. Application for reissue May 17, 1982, Ser. No. 378,825

Claims priority, application Japan, Jun. 23, 1978, 53-86127

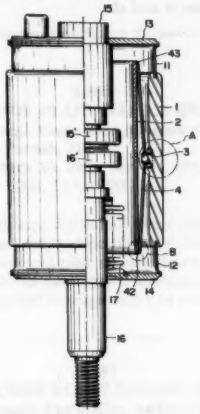
Int. Cl.³ H01H *33/66*

U.S. Cl. 200—144 B **7 Claims**

1. In a vacuum power interrupter, comprising an insulating cylindrical envelope of glass, a pair of end plates fastened to the respective axial ends of said cylindrical envelope, stationary and movable contact rods provided through said end plates, respectively, so that they are aligned to each other in the axial direction of the insulating envelope, the stationary and movable contact rods each have electrical contacts attached thereto at the opposite ends thereof, and an arc-shield member disposed within the envelope to surround the electrical contacts,

the improvement comprising:

(a) a plurality of hollow cylindrical supporting means each having substantially the same coefficient of thermal expansion of said insulating envelope, including a tubular supporting portion and a turnover outwardly U-shaped end portion, said end portion being embedded in



an inner wall of said insulating cylindrical glass envelope so that the axis of said hollow cylindrical supporting means is directed in the radial direction of said envelope, and

(b) a plurality of connecting metallic elongated plates, one end of which is fitted over [an exterior surface of] said [arc-shield member] *supporting means* while the other end of which is fixed to the exterior surface of said arc-shield member.

Re. 31,798

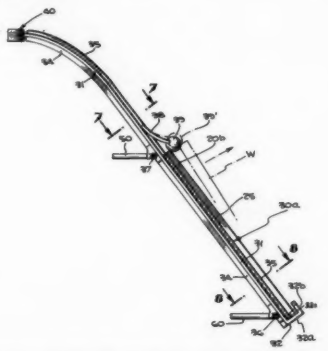
KNOCKDOWN SHADE ASSEMBLY FOR LIGHTING FIXTURE

Franz K. Weber, 15930 Royal Oak Rd., Encino, Calif. 91436, and Martin R. Reed, 323 N. Maple St., Burbank, Calif. 91505

Original No. 4,277,822, dated Jul. 7, 1981, Ser. No. 54,843, Jul. 5, 1979. Application for reissue Aug. 19, 1982, Ser. No. 409,520

Int. Cl.³ F21V *1/06*

U.S. Cl. 362—352 **12 Claims**



12. A snap-together frame for supporting the shade of a lighting fixture comprising in combination:

a plastic base member formed by cementing upper and lower plates together;

a central opening in said plastic base member;

at least one radially extending slot in said plastic base member, said slot having an internal recess therein;

at least one elongated rib made of resilient plastic material, said rib having an upper attachment portion adapted to be slideably inserted into said radially extending slot, and having a protrusion adapted for snap locking engagement with the internal recess in said slot;

said rib also having a lower portion, said upper attachment portion having an angular disposition of greater than 90° with respect to said lower portion;

said rib also having first and second latch openings on its underside, each of said latch openings having an arcuate surface extending through an arc of greater than 180 degrees; and

at least one metal brace adapted for snap fit insertion into said first latch opening of said rib.

PLANT PATENTS

GRANTED JANUARY 8, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,384

KALANCHOE PLANT NAMED "ACAPULCO"

Claude Hope, Cartago, Costa Rica, assignor to Pan American Plant Company, Parrish, Fla.

Filed May 19, 1983, Ser. No. 496,283
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe plant named Acapulco, as described and illustrated, and particularly characterized by its bright and uniform fuchsia flower color; compact habit; freely branching, with shoots formed at every node; highly floriferous habit, and by its suitability for production in 10 to 15 cm. pots.

5,385

KALANCHOE PLANT NAMED COZUMEL

Claude Hope, Cartago, Costa Rica, assignor to Pan American Plant Company, Parrish, Fla.

Filed May 19, 1983, Ser. No. 496,285
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct Kalanchoe plant named Cozumel, as described and illustrated, and particularly characterized by its orange flower color with bright yellow eye, compact habit, free branching, average 11-week flowering response, and its adaptability to production in 10–15 cm. pots.

5,386

KALANCHOE PLANT NAMED GRANADA

Claude Hope, Cartago, Costa Rica, assignor to Pan American Plant Company, Parrish, Fla.

Filed May 19, 1983, Ser. No. 496,298
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct Kalanchoe plant named Granada, as described and illustrated, and particularly characterized by its deep coral immature and pink mature flower color, compact habit, highly floriferous habit, free branching, average 13-week flowering response, and its adaptability to production in 10–15 cm. pots.

5,387

KALANCHOE PLANT NAMED CANCUN

Claude Hope, Cartago, Costa Rica, assignor to Pan American Plant Company, Parrish, Fla.

Filed May 19, 1983, Ser. No. 496,304
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct Kalanchoe plant names Cancun, as described and illustrated, and particularly characterized by its early flowering response, highly floriferous habit, orange flower color with yellow eye, compact habit, fast growth rate, free branching, average 11 week flowering response, and its adaptability to production in 10–15 cm. pots.

PATENTS

GRANTED JAN. 8, 1985

ERRATA

For CLASS	See PATENT NO.
033–366	4,492,029
446–250	4,492,057
446–462	4,492,058
384–463	4,492,415
384–474	4,492,416
568–075	4,492,652
534–796	4,492,653
534–827	4,492,654
264–200	4,493,031

PATENTS

GRANTED JANUARY 8, 1985

GENERAL AND MECHANICAL

4,491,985

HEAD COVERING FOR WOMEN WITH HAIR LOSS

Betty J. Dalton, 647 N. 16th St., Springfield, Oreg. 97477

Filed Sep. 29, 1982, Ser. No. 427,592
Int. Cl.³ A42B 1/04
U.S. Cl. 2—171 3 Claims

1. A head covering for the hairless scalp of women experiencing a total hair loss from chemotherapy, said covering comprising,

a continuous main body member of elastic material for stretched engagement about the wearer's head, said main body member adapted to overlie the back of the wearer's head,

a top piece of circular shape stitched at its edge to said continuous member,

a first fabric liner of a fleecy nature arranged at a frontal portion of said main body and extending at least partially about the interior thereof so as to be pressed into engagement with the wearer's forehead by said main body member,

a second fabric liner of a fleecy nature affixed to the underside of said top piece, and

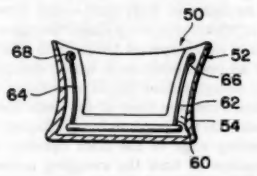
the main body member and said top piece being at least partially supported by said first and second fabric liners when the head covering is worn to render the appearance of a head covering worn over a full head of hair.

4,491,986

HEART VALVE

Shlomo Gabbay, 1740 Bogart St., Bronx, N.Y. 10462

Continuation-in-part of Ser. No. 685,543, May 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 609,685, Sep. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 533,989, Dec. 18, 1974, abandoned. This application Oct. 13, 1977, Ser. No. 841,791
Int. Cl.³ A61F 1/22
U.S. Cl. 3—1.5 9 Claims



1. A prosthetic heart valve, comprising:

(a) a supporting structure comprising a base ring having two upwardly projecting and diverging struts, said base ring including a first ring portion which is formed from semi-rigid, flexible material and a second ring portion which is formed from soft flexible material;

(b) a membrane forming lips which surround said base ring and struts to form a tubular opening with an exit end and an entrance end which are substantially of equal area; and

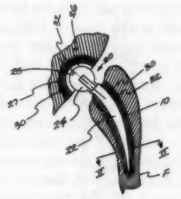
(c) said lips being formed to close in an overlapping manner.

4,491,987

METHOD OF ORTHOPEDIC IMPLANTATION AND IMPLANT PRODUCT

Joon B. Park, Clemson, S.C., assignor to Clemson University, Clemson, S.C.

Filed Sep. 24, 1979, Ser. No. 78,225
Int. Cl.³ A61F 1/00, 1/24, 5/04
U.S. Cl. 3—1.91 14 Claims



1. An orthopedic prosthesis for implantation within a warm blooded mammal with a bone cement composition, said prosthesis comprising a base material structurally defined as to shape and strength to assimilate a portion of hard mammal tissue, said prosthesis having a polymer coating thereabout for contact with bone cement during implantation and having an enlarged surface area therebeneath to provide an improved bond between said prosthesis and said polymer coating, said polymer coating being uniform about said prosthesis, and being up to about 2 millimeters thick, being substantially completely polymerized, having a substantially pore free outer surface, and being compatible with said bone cement composition used during implantation to achieve a chemical bond therebetween.

4,491,988

IN-TANK TOILET BOWL CLEANER DISPENSER

William G. Mizuno, Saint Paul, Minn., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Filed Jan. 28, 1983, Ser. No. 461,968
Int. Cl.³ E03D 9/02
U.S. Cl. 4—228 15 Claims

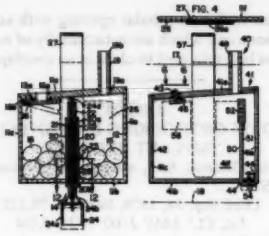
1. A dispenser for use in a flush tank of a toilet, the tank having a first water level during quiescent periods and a second water level when the toilet is flushed, said dispenser comprising:

(a) a housing having a top and bottom, said housing defining a reservoir having an inlet proximate said top and an outlet positioned lower than said inlet, said reservoir holding a product to be dispensed, the product dissolving in water forming a solution;

(b) a first valve means for regulating flow of water from the flush tank into said reservoir through said inlet, said first valve means responsive to changes from the first water level to the second water level;

(c) a second valve means for regulating flow of solution out of said reservoir through said outlet, said second valve means responsive to changes from the first water level to the second water level, whereby when the water rises to its first water level, said second valve means is closed and water enters the reservoir through said inlet until said reservoir is filled causing said first valve means to close,

said first and second valve means minimizing migration of the solution out of said reservoir, and when the water is at



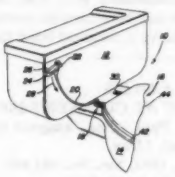
the second water level, said second valve means opens allowing the solution to flow out of said outlet.

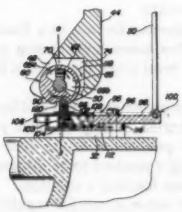
4,491,989

CLOSURE DEVICE FOR TOILET SEATS

John F. McGrail, 7701 Warner, Apt. C197, Huntington Beach, Calif. 92647

Filed Apr. 2, 1984, Ser. No. 595,688
Int. Cl.³ A47K *13/10*
U.S. Cl. 4—251 **9 Claims**





1. An apparatus for automatically releasing a seat, or together a lid and a seat, for a toilet or a commode having a bowl, a water closet, and a flushing handle, wherein the apparatus comprises:

a releasable hinge-closing means mounted to said bowl of said toilet and to said lid and seat thereof, allowing said lid, or lid and seat, to be lowered from an open upright position to a closed horizontal position;

actuating means connected between said releasable hinge-closing means and flushing handle of said toilet, whereby said actuating means is releasably disengaged from said toilet lid;

dampening means mounted to said lid and adapted to be engaged with said releasable hinge-closing means, whereby the downward movement of said lid, or said lid and seat, from an open to a closed position is controlled thereby; and

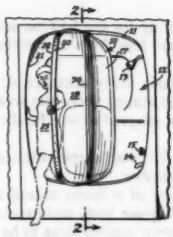
latching means interposed between said toilet lid and said toilet seat, whereby said seat is coupled to said lid when both are in an open upright position.

4,491,990

SHOWER DOOR

Thomas D. Robinson; Lewis A. Sharp, Jr., both of Nashville, and George P. McAllister, Franklin, all of Tenn., assignors to Aquaris Industries, Incorporated, Nashville, Tenn.

Filed Apr. 10, 1981, Ser. No. 252,868
Int. Cl.³ A47K *3/22*
U.S. Cl. 4—607 **7 Claims**



1. In a shower bath cabinet including a door opening having a fixed edge of predetermined contour, a shower door comprising:

(a) a one-piece body including a dished closure panel having a peripheral edge portion of the same shape as the contoured edged of the door opening to be closed by said door,

(b) said closure panel also having a front surface, a concave rear surface, top and bottom portions and first and second opposite side portions,

(c) said edge portion comprising a substantially continuous rim, including first and second opposed side rim portions, projecting rearward from said closure panel and terminating in a free peripheral edge and

(d) pivotal support means on the top and bottom portions of said body for attaching said body to the fixed edge of the door opening in operative position for pivotal movement of said body about a fixed vertical axis in the door opening (extending) spaced between said first and second side rim portions so that said body may swing between a closed position in which said body closes the door opening and said vertical axis is spaced behind said concave rear surface, and an open position in which one side portion of said body swings behind the door opening and the other side portion swings in front of the door opening, and

(e) one of said side rim portions being adapted to engage the corresponding edge of the door opening when in said closed position to limit the swinging movement of said panel away from said open position.

4,491,991

TOILET COVER ATTACHMENT

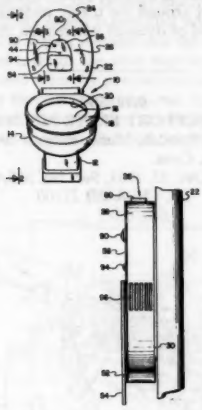
Steven L. Herbruck, 1441 Devonshire Dr., Oxnard, Calif. 93030

Filed Jun. 27, 1983, Ser. No. 507,725
Int. Cl.³ A47K *17/00*
U.S. Cl. 4—661 **10 Claims**

1. In combination with a toilet, said toilet having a bowl, said

toilet having a seat, said toilet having a cover, said cover being pivotable between a lower (horizontal) position and an upper (vertical) position, said lower position preventing access into said bowl, said upper position permitting access into said bowl, a toilet cover attachment comprising:

an annunciator assembly including a first annunciator and a



second annunciator, said first annunciator being activated upon said cover being located in said upper position and deactivated upon said cover being located in said lower position; and

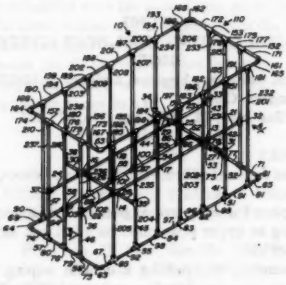
said second annunciator being time delay activated upon said cover being located in said upper position and deactivated upon said cover being located in said lower position.

4,491,992

CONVERTIBLE BABY CRIB AND PLAYPEN

Frederick H. Wittman, 519 W. Taylor St., Sp. #127, Santa Maria, Calif. 93454

Filed Nov. 3, 1983, Ser. No. 548,281
Int. Cl.[3] A47D 7/00, 13/06
U.S. Cl. 5—93 R 3 Claims



1. An adjustable-sized, readily assembled and readily disassembled baby crib made up of a series of plastic tube sections and plastic tube fittings, said crib including in combination:

(1) an invertible bottom portion useful per se as a small short crib and, when inverted, useful as a base portion of a taller playpen type of crib, comprising

(a) a planar assembly of two pairs of cross fittings,

two identical lengthwise-extending first tube sections connecting the cross fittings of each pair together,

four identical lengthwise-extending first tube sections, one extending out from each cross-fitting in line with a said first tube section,

two identical widthwise-extending third tube sections, connecting corresponding cross fittings of one pair to those of the other pair,

four identical shorter widthwise-extending fourth tube section, each extending out from a said cross fitting in line with a third widthwise-extending tube section,

a set of eight 90° first tee fittings, each with one upper socket, one lower socket, and one middle socket, a said middle socket being attached to the distal end of each of the second and fourth tube sections,

(b) a first series of identical vertical fifth tube sections, each extending upwardly from an upper sockets of each said first tee section, and

(c) a first generally rectangular assembly, having an elbow fitting at each corner a set of at least eight second tees, and sixth tube sections horizontally connecting said tees of said second set to each other and to said elbow fitting there connected to said elbow fitting being cemented thereto, each second tee being spaced so as to be in line with a said first tee and receiving the upper end of said fifth vertical tube section, said generally rectangular assembly having also a set of intermediate third tees in between the successive second tees and connected to them by sixth tube sections, and

(2) an upper, second generally rectangular assembly substantially identical to said first generally rectangular assembly and which, when said bottom portion is inverted so that said first rectangular assembly rests on a floor, is spaced well above said planar assembly,

(3) a series of identical long vertical seventh tube sections substantially longer than said fifth tube sections joining the third tees of said first rectangular assembly to corresponding second tees of said second rectangular assembly,

(4) a series of identical vertical eighth tube sections connecting said first tees to corresponding tees of said second, generally rectangular assembly, the combined lengths of each pair of fifth and eighth tube sections plus their fittings, equaling the length of the seventh tube sections.

4,491,993

MECHANISM FOR MAINTAINING THE SHAPE OF A FLOATATION SLEEP SYSTEM

Philip J. Santo, 12 Mountain Rd., Rochester, N.Y. 14625

Filed Dec. 15, 1982, Ser. No. 450,021
Int. Cl.[3] A47C 27/08
U.S. Cl. 5—451 5 Claims

1. Mechanism for maintaining the shape of a floatation sleep system, such system including a bladder having flexible walls defining a chamber adapted to be filled with fluid and a marginal perimeter edge support for such bladder, said mechanism comprising:

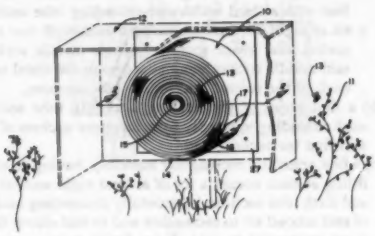
a flexible dimensionally stable sheet; and

means for attaching said sheet to opposed marginal edges of said bladder, such means including matting releasable fastener members fixed to opposed marginal edges of the underside of said bladder and opposed marginal edges of said sheet respectively, so that such sheet may extend in intimate contact from one edge, across the top portion of said bladder, around the opposite marginal perimeter support to the other edge, whereby such sheet is constrained to oppose fluid forces on the marginal perimeter support.

4,491,994
WILD BEE NESTING DOMICILE

Nabil N. Youssef, 2168 N. 1450 East, North Logan, Utah 84321

Filed Aug. 4, 1983, Ser. No. 520,472
Int. Cl.³ A01K *47/00*
U.S. Cl. 6—1 9 Claims



1. A wild bee nesting domicile having a multiplicity of wild bee nesting bores, said domicile comprising:

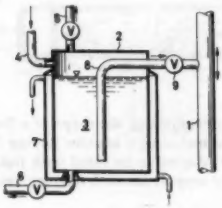
a continuous elongate strip assembly of thin flexible sheet paper comprising a pleated strip, a matching elongate backing strip and means securing the pleated strip with the roots of the pleats against one of the surfaces of the backing strip, said continuous strip assembly being secured in rolled form so tht the tips of the pleats are against adjacent portions of the other surface of the backing strip so that the pleated strip forms with the backing strip a multiplicity of nesting bores, each bore extending longitudinally from one end of the rolled strip assembly to the other end thereof, all of said nesting bores being on the same side of said pleated strip; and

a closure member secured against one end of the rolled strip assembly so as to close one end of each of the nesting bores.

4,491,995
PROCESS FOR THE LEVEL EXHAUST DYEING OF POLYESTER FIBERS

Siegfried Glander, Bad Soden am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 9, 1983, Ser. No. 473,757
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1982, 3210380
Int. Cl.³ D06B *5/18*
U.S. Cl. 8—158 12 Claims

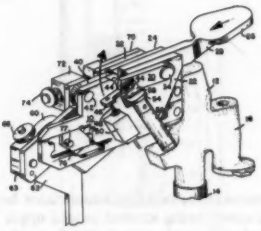


1. In a process for the level exhaust dyeing of textile material which consists of hydrophobic synthetic fibers either on its own or as a component of mixtures with natural or other synthetic fibers, with heat-settable colorants in a closed machine system at temperatures between 90° and 140° C., from an aqueous medium by means of a moving liquor which is circulated in the dyeing system until the colorant has exhausted onto the textile material and become fixed therein, the improvement which comprises using as the heat-settable colorant dyestuffs and/or pigments which are virtually insoluble or sparingly soluble in water, without prior formulation with a finish designed for suitable dyeing properties, dissolving the same in one or more organic solvents which, under dyeing conditions, are sufficiently soluble in or miscible with water, and then introducing the solution thus obtained into the circulating aqueous liquor which is already at the dyeing temperature, is flowing through or around the textile material, and is free of dyestuff or depleted of dyestuff whereupon the dyeing is performed as usual.

4,491,996
INSOLE SUPPORT PLATE MECHANISM

Alphonse C. Kulik, Ipswich, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Oct. 27, 1981, Ser. No. 315,404
Int. Cl.³ A43D *21/00*
U.S. Cl. 12—10.1 3 Claims



1. An adjustable insole support plate mechanism for a shoe lasting machine, comprising:

an insole support plate for receiving an moving a shoe assembly bottom down; and

a cam guided toggle link means for controllably toewardly advancing said insole support plate, while said plate is in a toeward down pre-lasting orientation to permit the shoe assembly to be more readily gripped by pincers in the shoe lasting machine said cam guided toggle link means comprising means for controllably retracting heelwardly said insole support plate in a toe downward orientation from said advanced position.

4,491,997
MACHINE FOR LASTING HEEL SEAT PORTIONS OF SHOES

Frank C. Price, Leicester, England, assignor to USM Corporation, Farmington, Conn.

Filed Mar. 21, 1983, Ser. No. 477,313
Int. Cl.³ A43D *21/00*
U.S. Cl. 12—12.1 9 Claims

1. A machine for lasting heel seat portions of shoes, comprising:

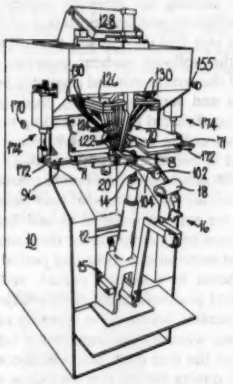
a shoe support for supporting, bottom uppermost, a shoe comprising an upper positioned on a last and an insole on the last bottom;

a wiper assembly, comprising a central wiping member, carried by a support therefor, and two wiper plates, each carried by a wiper carrier, said member being fixed against rotation, while said carriers are mounted for pivotal movement, each about an axis which lies within the confines of the central wiping member, the member and plates presenting a substantially continuous leading edge portion whereby lasting marginal portions of the upper of a shoe supported by the shoe support can be wiped over and pressed against corresponding marginal portions of the insole of such shoe; and

fastener-inserting means, associated with the wiper assembly, whereby fasteners can be driven, through a series of

apertures formed in the wiping member and wiper plates, adjacent the leading edge portion presented thereby, for securing said wiped-over lasting marginal portions of the upper to the corresponding marginal portions of the insole, two such apertures being disposed side-by-side in the central wiping member, and the fasteners driven through said apertures being the most heelwardly disposed of the fasteners inserted by the fastener-inserting means,

wherein advancing means is provided whereby the support for the central wiping member and the wiper carriers can be advanced towards the shoe support, cam means also being provided whereby pivotal movement of the wiper carriers can be effected in response to operation of the advancing means, the position to which the central wiping member is advanced as aforesaid determining the location



of insertion of the most heelwardly disposed fastener(s), while the amount of pivotal movement of the wiper carriers, and thus the wiper plates, determines the overall pattern in which the fasteners are inserted, characterized in that the advancing means is operatively connected to the wiper carriers, and each wiper carrier is connected to the support for the central wiping member, for relative sliding movement therebetween, by an arcuate groove-and-projection connection, the center of curvature of which coincides with the axis of said wiper carriers and in that the construction and arrangement of the cam means is such that during a first part of the operation of the advancing means the wiper carriers are advanced towards the shoe support, while in a subsequent part each carrier merely pivots about its axis.

4,491,998

SCRUBBER MOP

Frank G. Wilson, Malvern, and William A. Patton, Newtown Square, both of Pa., assignors to Kendo Products Co., Inc., Paoli, Pa.

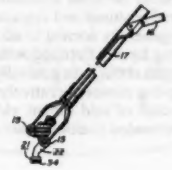
Filed Sep. 21, 1983, Ser. No. 533,731
Int. Cl.³ A47L *13/144*
U.S. Cl. 15—119 A **30 Claims**

1. A scrubber head for use in combination with a wringer mop of the type having at least one rotatable wringer roller extending substantially orthogonally and in spatially fixed position to a mop handle, a mop head having a surface engagingly underlying the wringer roller and adapted to having its wringer engaging surface translated with respect to the roller to rotate the latter and wring out the mop head, and an actuating member effective to translate the wringer engaging surface of the mop head in opposite directions to effect opposite rotations of the roller and to alternately wring out the mop head and restore it to use position, said scrubber head comprising in combination,

(a) a scrubber pad,

(b) scrubber pad support means which mechanically support said scrubber pad, and

(c) pivot means connected to said scrubber pad support means and being also couplable to the wringer roller of



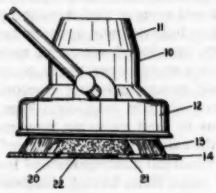
the wringer mop for rotation therewith when the wringer roller is rotated by the engaging surface of the mop head, said scrubber pad support means being pivoted up out of the way when the mop head actuating member moves the mop head into use position and being pivoted down into working scrubbing position when the mop head actuating member moves the mop head to wring it out.

4,491,999

BUFFING PAD RETAINER

Ernest R. Babcock, 257 Lafayette, Ionia, Mich. 48846

Filed Jul. 19, 1982, Ser. No. 399,470
Int. Cl.³ B24B *29/00*; A47L *11/14*
U.S. Cl. 15—230 **4 Claims**



1. A buffing pad retainer for retaining an annular buffing pad in operable engagement with the bristles of a rotating annular floor machine brush comprising a truncated conical disk having a height no greater than the length of the bristles of said brush and a major diameter approximately equal to the bore diameter of said annular brush, said conical disk having a depending cylindrical coaxial disk portion having a diameter approximately equal to the bore diameter of said annular buffing pad and a height such that the disk portion extends into the bore in the pad but does not extend below the bottom of the pad when the retainer is mounted in a floor machine brush for buffing, the buffing pad retainer urging the buffing pad to rotate with the rotation of the floor machine brush while the pad remains flat on the floor over its entire surface, the cylindrical disk portion having a lower end formed of a material that does not damage the floor surface.

4,492,000

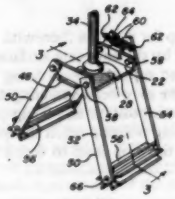
CHIMNEY CLEANER

Kermit J. Skogen, Rte. 1, Box 199, Princeton, Minn. 55371

Filed May 18, 1982, Ser. No. 379,487
Int. Cl.³ F23J *3/02*
U.S. Cl. 15—242 **2 Claims**

1. A chimney cleaner including a mount having opposite side portions, an elongated upstanding support member having a lower end, means on said mount attaching the lower end of

said support member to said mount between said opposite side portions and with said support member disposed generally normal to a plane extending between and along said opposite side portions, a pair of depending support arms including upper base and lower free end portions, pivot means pivotally supporting said upper base end portions from corresponding opposite side portions of said mount for independent swinging of said arms about generally parallel axes extending along said opposite side portions between extending downwardly and outwardly divergent positions and retracted generally parallel positions disposed generally normal to said plane, said free end portions of said arms having fluttered rollers loosely journaled therefrom for rotation about axes generally paralleling the first mentioned axes, spring means operatively connected between said arms independent of said mount yieldingly biasing said arms toward said extended positions, said arms each including



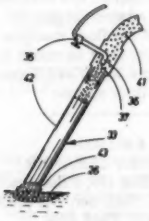
a pair of depending long and short parallel links, each of said rollers being journaled between the lower ends of the associated pair of links, the upper ends of each pair of links being pivotally supported from said mount, said mount including a first portion disposed below said first mentioned axes engageable by corresponding short links of said arms to limit swinging movement of said arms to said retracted positions, said upper ends of said long links defining upper end extensions projecting above the first mentioned axes, said spring means including expansion spring means operatively connected between said extensions, said mount including a second abutment portion disposed above said first mentioned axes and engageable by said extensions to limit swinging movement of said support arms toward the extended positions thereof, each of said rollers including a cylindrical hub portion and longitudinally extending generally radial flutes having sharpened outer edges.

4,492,001

METHOD TO CLEAN UP OIL SPILLS OR SIMILAR SUBSTANCES AND A DEVICE TO PRACTICE THIS METHOD

Stig Erik T. Hedrenius, Stockholm, Sweden, assignor to Sancon Aktiebolag, Stockholm Frihamn, Sweden

Filed Sep. 29, 1982, Ser. No. 427,579
Int. Cl.³ A47L 7/00
U.S. Cl. 15—320 **1 Claim**



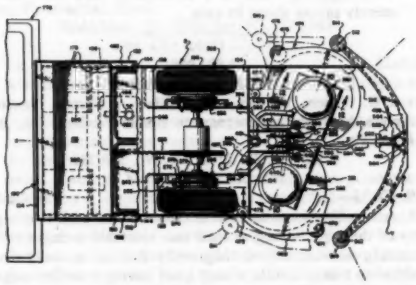
1. A device for cleaning up pollutants resulting from oil spills and chemicals polluting an area on the ground by spreading granulate sorbent material over said area during a spreading period and sucking up the sorbent material carrying adsorbed pollutants from said area during a suction period, said device comprising supply means and first duct means for transporting the sorbent material respectively to and from a nozzle unit connected to said first duct means for blowing out and sucking up the sorbent material, second duct means for supply of compressed air, ejector means actuated by said compressed air and adjustable between a spreading position, taken during the spreading period, in which the ejector directs a first air current for transportation of the sorbent material in said first duct means up to the nozzle unit to blow the sorbent material out through the nozzle unit directly on said area causing the sorbent material to penetrate the polluted area by means of a blasting action and a sucking position, taking during the suction period, in which the ejector means directs a second air current for sucking up spreaded sorbent material carrying adsorbed pollutants and transportation of the polluted sorbent material via said first duct means to receptacle means for disposing of the polluted sorbent material, said ejector being mounted on the nozzle unit and pivotable between said spreading position and sucking position, said ejector including an outlet opening directed in said spreading position forwardly to a common spreading and sucking opening of the nozzle unit, and directed in said sucking position away from said common opening of the nozzle unit, and power means for the generation of compressed air for said second duct means, spreader means for feeding the sorbent material to said first duct means, said first duct means being common for the transportation of unpolluted sorbent material in a spreading period as well as polluted sorbent material in a suction period, and means adjustable between a first position during the spreading period in which the communication between the spreader means and first duct means is open, whereby communication between the receptacle means and the first duct means is discontinued, and a second position during the suction period in which communication between the spreader means and the first duct means is discontinued and the communication between the receptacle means and the first duct means is open.

4,492,002

FLOOR CLEANING MACHINE

Steven J. Waldhauser, Niagara Falls, N.Y., and Dennis J. Cornell, Toronto, Canada, assignors to Wetrok, Inc., Niagara Falls, N.Y.

Division of Ser. No. 186,420, Sep. 12, 1980, Pat. No. 4,380,844.
This application Apr. 22, 1983, Ser. No. 487,503
Int. Cl.³ A47L 11/30
U.S. Cl. 15—320 **5 Claims**



2. An automatic, self-contained and self-propelled walk behind floor cleaning machine including

a body;

propulsion means capable of propelling said body in a generally forward direction over the surface of the floor to be

cleaned, said propulsion means including ground engaging wheels;

scrubber means carried by said body for wetting and cleaning a width of the surface of the floor, said scrubber means including brush means, and said scrubber means being mounted behind said ground engaging wheels;

vacuum means carried by said body for drying the cleaned surface, said vacuum means including

a curved squeegee of a width slightly greater than the width of the surface of the floor cleaned by said brush means, and

means mounting said squeegee immediately behind said brush means and for swinging movement about a generally vertically extending axis in response to turning movement of the floor cleaning machine whereby said squeegee properly tracks said brush means to insure that virtually all water deposited on the floor by the scrubber means is picked up; and

control means operably associated with said propulsion means, scrubber means and vacuum means and including controls located to the rear of the body and engageable by a walk behind operator.

4,492,003

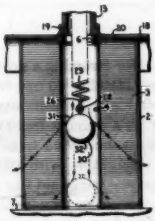
FILTER CLEANING DEVICE

John F. Boylan, Rte. 1 - Box 70, Ulysses, Kans. 67880

Filed Jul. 25, 1983, Ser. No. 516,527

Int. Cl.³ B08B 5/02

U.S. Cl. 15—406 **5 Claims**



1. A portable cleaning device for purging a filter; said filter having a medium surrounding and defining a chamber, and having at least one end with an opening to said chamber, said cleaning device comprising:

(a) a tank for containing pressurized gas;

(b) charging means on said tank for filling same;

(c) a conduit extending from said tank and having an end with an outflow valve therewith to permit rapid passage of gas through said conduit;

(d) a shield on said conduit adjacent said end and having a surface extending outwardly from said conduit for sealing engagement with said filter around the end opening thereof with said conduit end communicating with said filter chamber end communicating with said filter chamber through said filter end opening; said filter being held in place by a user by positioning said filter between said shield surface and a supporting surface; and

(e) an extensible member longitudinally mounted within said conduit and having a lower end portion with a gas diverter means thereon for forcing gas flow from said tank radially outwardly through said medium to thereby purge it, said diverter means being movable between an upper position located adjacent an upper part of said chamber and a lower position located adjacent a lower part of said chamber; said extensible member and diverter means being responsive to gas flow from said tank to extend and variably position said diverter means between said upper and lower positions.

4,492,004

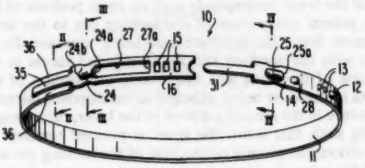
EARLESS CLAMP STRUCTURE

Hans Oetiker, Oberdorfstrasse 21, CH-8810 Horgen, Switzerland

Filed Dec. 3, 1982, Ser. No. 446,503

Int. Cl.³ B65D 63/02

U.S. Cl. 24—20 R **38 Claims**



1. A clamp structure, especially for use in applications in which space conditions do not permit any projecting parts such as plastically deformable ears, comprising clamping band means having open ends formed by an inner and outer band portion intended to overlap, and means mechanically interconnecting the overlapping open ends of the band means including outwardly extending hook means in the inner band portion operable to engage in aperture means in the outer band portion in the installed condition of the clamp structure, characterized in that the means mechanically interconnecting the open ends enable tightening of the band means about an object to be fastened and include tool-engaging means provided in the inner and outer band portions, said tool-engaging means being formed by pressed-out portions pressed-out of the inner and outer band portions and extending generally in the circumferential direction so that each pressed-out portion remains integral at least on both sides thereof with the respective band portion, whereby said tool-engaging means are able to withstand substantial forces in the circumferential direction without tearing which permit a secure tightening of the clamp structure about the object to be fastened without the use of any other tightening means in the clamp structure.

4,492,005

CONDUIT CLAMP (CASE 1)

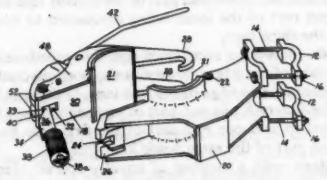
Maxwell G. Begley, 632 Light St., Dianella, Western Australia 6062, and Keith Munslow-Davies, 7 Chaffers St., Morley, Western Australia 6062, both of Australia

Filed Nov. 16, 1982, Ser. No. 442,163

Claims priority, application Australia, Jun. 23, 1982, PF4557

Int. Cl.³ B65D 63/02; F16L 3/08

U.S. Cl. 24—270 **9 Claims**



1. A conduit clamp comprising means for securing a conduit to another structure, a pair of jaws arranged to be clamped around a conduit, means on one side of a first jaw arranged to engage pivotally with complementary means on the corresponding side of a second jaw, means for closing the jaws into clamping engagement with a conduit which closing means comprises an open sided recess in one jaw, a locking pin mounted in an aperture in the other jaw, a lever having an inner end, the inner end of the lever being pivotally connected

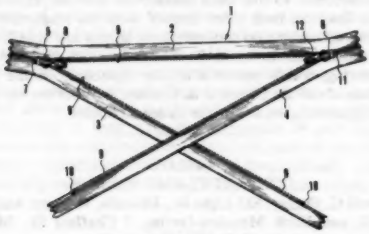
to the locking pin, and the inner end of the lever being pivotally connected to the other jaw at a spacing from the pivotal connection to the locking pin and being located adjacent the aperture in the other jaw, the lever having a first position in which the locking pin is located in the open sided recess which first position of the lever corresponds with a clamping position of the jaws, the lever having a second position in which the locking pin is pivoted away from the recess which second position of the lever corresponds with an open position of the jaws, the pivotal connection of the locking pin to the lever being remote from the aperture and being substantially in alignment with the aperture and the open sided recess in the first position of the lever and the pivotal connection of the locking pin to the lever being adjacent to but disposed laterally of the aperture in the second position of the lever, the arrangement being such that when the lever is pivoted towards its second position, the pivotal connection of the locking pin and lever initially moves towards the aperture to push the locking pin through the aperture and recess so as to release the locking pin, and then the pivotal connection of the locking pin and lever moves laterally relative to the aperture so as to cause the locking pin to be pivoted against an edge of the aperture away from the recess, and when the lever is pivoted towards its first position the locking pin pivots back into the recess and is then pulled through the recess and aperture so as to be locked into the recess.

4,492,006

THREE-TAPE TYPE ZIPPER

Takashi Ishii, 14-1423, Kaminakazato 1028, Isogo-ku, Yokohama, Kanagawa, Japan

Filed Apr. 11, 1983, Ser. No. 483,756
Int. Cl.³ A44B *19/34*
U.S. Cl. 24—382 **3 Claims**



1. A three-tape type zipper essentially comprising in combination;

the first tape with a number of equally spaced elements fixed to one of the edges thereof, one end part of said first tape being connected to one end part of the second tape and the other end part of the same being connected to one end part of the third tape,

the second tape with a number of equally spaced elements fixed to one of the edges thereof at the position confronting to those on said edge of the first tape, both tapes being able to be fastened, one end part of said second tape being connected to said one end part of the first tape and the other end part of the same being kept free,

the third tape with a number of equally spaced elements fixed to one of the edges thereof at the position confronting to those on said edge of the first tape, both tapes being able to be fastened, one end part of said third tape being connected to said other end part of the first tape and the other end part of the same being kept free,

the first slider serving to fasten the first and second tapes together by moving said slider from the first end portion where the one end parts of the first and second tapes are connected to each other to the second end portion where the other end part of the first tape and the one end part of the third tape are connected to each other, said moving of said first slider being performed by means of a tab attached thereon until the first slider is to be stopped by the second slider in contact with the stopper which connects the first and third tapes, and

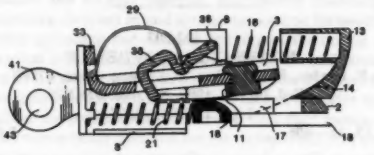
the second slider serving to fasten the first and third tapes together by moving said slider from the aforesaid second end portion to the aforesaid first end portion, said moving of said second slider being performed by means of a tab attached thereon until the second slider is to be stopped by the first slider in contact with the stopper which connects the first and second tapes.

4,492,007

FASTENING MEANS FOR SAFETY BELTS

Ulf Tolfsen, Fredrikstad, Norway, assignor to Loyd's Industri A/S. Boks 609, Fredrikstad, Norway

Filed Apr. 13, 1983, Ser. No. 484,513
Claims priority, application Norway, Apr. 26, 1982, 821350
Int. Cl.³ A44B *11/25*
U.S. Cl. 24—461 **17 Claims**



1. In a fastening means for fastening a safety belt of the type wherein a locking tongue attached to one free end of the belt is slidably engagable with locking means attached to the other free end of the belt or to a vehicle mounting element, and wherein said locking means includes a frame for supporting a locking flap releasably engageable with said tongue, and release means for lifting and releasing said flap from engagement with said tongue; the improvement comprising blocking means for urging said locking flap from an open, raised position to a closed, lowered position in engagement with said locking tongue in response to sliding insertion of said locking tongue into said locking means, for retaining said locking flap in the open, raised position when the seat belt is unfastened, and for resisting initial action of said release means so that the force required to initiate release of the locking tongue is greater than that required to complete the release, said blocking means including a blocking flap pivotally associated with said frame, and biasing means for urging said locking flap into an open, raised position, and for urging said blocking flap against said locking flap to lower it into engagement with said locking tongue when said locking tongue is inserted into said locking means.

4,492,008

METHODS FOR MAKING HIGH PERFORMANCE LATERAL BIPOLAR TRANSISTORS

Narasipur G. Anantha, Hopewell Junction; Tak H. Ning, Yorktown Heights, and Paul J. Tsang, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 4, 1983, Ser. No. 520,366
Int. Cl.³ H01L *27/08, 21/76*
U.S. Cl. 29—571 **13 Claims**

1. Method of fabricating a high performance lateral PNP transistor comprising:

providing a monocrystalline semiconductor body having a principal surface of N conductivity type and a buried N+ region with an N+ reach-through connecting said buried region to said surface;

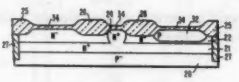
forming the collector region of said transistor into said surface by diffusing P type impurities into the desired region of said body;

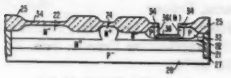
etching a substantially vertical walled groove in said monocrystalline semiconductor body in the area designated to be on the emitter contact;

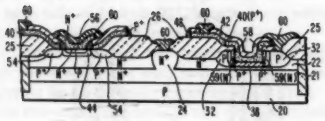
thermally diffusing N type impurities into the edges and bottom of said groove;

ion implanting oxygen into the bottom of said groove to form a silicon dioxide region at the bottom of the groove;

forming a P+ polycrystalline silicon layer over said surface so that portions of the layer are in direct contact with said groove;







forming an insulator layer upon the top surface of said polycrystalline silicon layer;

patterning said polycrystalline silicon layer and insulator layer with substantially vertical edges wherein the layer remains over areas designated to be the emitter regions of said lateral PNP transistor;

heating the structure to form the P+ emitter region around the side edges of the said P+ polycrystalline silicon filling said groove; and

making electrical contact to the collector, the emitter through said P+ polycrystalline layer and the base through an N+ reach-through to said buried N+ region.

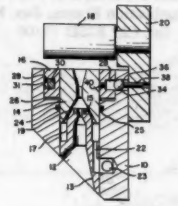
4,492,009

YARN TEXTURING JET

Brian M. Agers, and Arnold S. Goldstein, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 29, 1983, Ser. No. 536,314
Int. Cl.³ D02G *1/16*
U.S. Cl. 28—254 **4 Claims**

1. In a yarn texturing jet including a body having yarn inlet and outlet ends connected by a central bore, means for introducing pressurized gas through a gas inlet into said bore, a venturi located in said bore at said outlet end, said venturi being axially slidable in said body from a preset operating position to a string up position back to a preset operating position, a yarn guiding element extending into said bore from the yarn inlet end of the body, said yarn guiding element having a pasage therethrough for guiding yarn from the yarn inlet to the venturi and a cylindrical baffle attached to a bracket located adjacent the outlet end of the jet, the improvement comprising: a collar attached to said venturi, said collar having



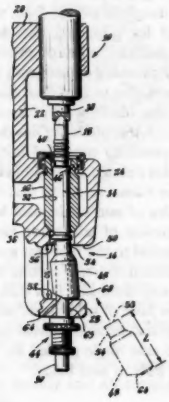
a circumferential groove and being slidably located inside the body at the outlet end thereof; and means engaging said groove to position said venturi in the string up position or the operating position.

4,492,010

GAS CHECK SEATING BODY

C. Kenneth Ramage, Middletown, Conn., assignor to Lyman Products Corporation, Middlefield, Conn.

Filed Jul. 14, 1983, Ser. No. 513,758
Int. Cl.³ B21K *21/06*
U.S. Cl. 29—1.22 **9 Claims**



1. A device for squarely attaching a gas check onto a bullet in a bullet sizing apparatus having a frame which has one section shaped to receive a bullet swaging die through which a bullet is moved in a swaging direction while seated against an ejector rod located to snugly slide through the die, said frame further having a shelf spaced from the one section in the swaging direction, said shelf adjustably supporting a push rod one end of which may be adjustably spaced from the frame section so as to seat and move with the ejector rod when a bullet is pushed through the swaging die, comprising:

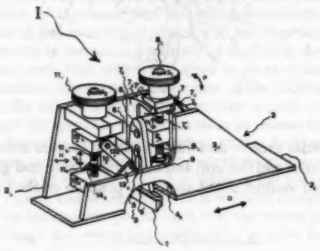
a replaceable gas check seating body having a length so as to fit between the frame shelf and the swaging die placed in said frame section while being of sufficient length so as to seat an ejector rod at a location where one end of the ejector rod can support a gas check and enables a shank of a cast bullet to be pressed into the gas check when so seated on the ejector rod.

4,492,011

SCRAPER TO ROUGH DOWN THE SURFACES OF A COATED FINISH

Antoine Zaragoza, and Raymond Zaragoza, both of 69, Rue Lucien Cassagne, 31500 Toulouse, France

Filed Jan. 15, 1982, Ser. No. 339,650
Claims priority, application France, Jan. 16, 1981, 81 01103
Int. Cl.³ B23D 79/06
U.S. Cl. 29—81 G **4 Claims**



1. A hand-operated scraping tool to rough-hew surfaces coated with a primer, said tool comprising:

a frame, said frame comprising at least two laterial walls, a rectangular face defining a plane, said lateral walls connected to said face, a central opening defined by said face, a blade having a bevelled edge positioned within said opening, said blade inserted between said lateral walls to project beyond said face, said blade defining a plane perpendicular to the plane of said face, said blade being slidingly mounted for adjusting the depth of penetration thereof in the material to be rough-hewed, and said blade being pivotally mounted on said rod, with said rod having an axis perpendicular to said face for correcting the displacement of the blade with reference to the face, an upper portion of the blade set inside said frame, a first threaded rod pivotally mounted within said frame, two superposed holes defined by said blade, a first teat rigidly locked with the frame, said first teat set inside one of said superposed holes of said blade, said hole being elongated for allowing motion of said blade along said first teat, a second teat parallel to the first teat and movably mounted on the first threaded rod, said second teat adapted to move towards and away from said first teat, said second teat set inside the other hole of said blade, said other hole allowing said second teat housed therein to transmit motion to said blade, and said blade guided by said first teat inside said elongated hole of said blade.

4,492,012

METHOD OF MAKING ROLL FOR USE IN PRINTING

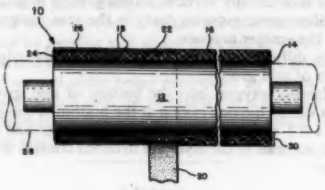
Jerome Pala, Arlington Heights; Yale Karmell, Chicago, and Thaddeus M. Muzyczko, Downers Grove, all of Ill., assignors to Samuel Bingham Company, Mt. Prospect, Ill.

Filed Jan. 13, 1982, Ser. No. 339,163
Int. Cl.³ B21K 1/02
U.S. Cl. 29—148.4 D **26 Claims**

1. A method of making a roll for use in a printing operation comprising:

stretching a tubular mesh sleeve onto a metal mandrel;

covering said sleeve with an elastomer composition having a plurality of discrete fibers substantially dispersed therein;



vulcanizing said covering to said sleeve; and

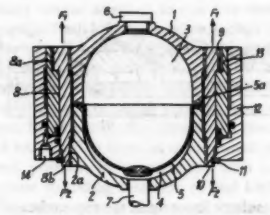
removing said mandrel.

4,492,013

METHOD FOR MANUFACTURING A PRESTRESSED HYDRAULIC ACCUMULATOR

Louis C. Porel, Rambervillers, France, assignor to Hydro Rene Leduc, Baccarat, France

Filed Feb. 20, 1981, Ser. No. 236,195
Claims priority, application France, Feb. 27, 1980, 80 04313; Apr. 30, 1980, 80 09781
Int. Cl.³ B23P 15/00
U.S. Cl. 29—157 R **5 Claims**



1. A method for manufacturing an oleopneumatic accumulator of the type having a first shell having an open end forming a first chamber adapted to receive pressurized gas, and a second shell having an open end forming a second chamber adapted to receive a pressurized hydraulic fluid comprising the steps of:

disposing a flexible membrane between said open ends of said first and second chambers to form a fluid tight seal therewith;

engaging opposite ends of an annular elastic metal clamping band to tension said band in a direction along the longitudinal axis perpendicular to a diameter of said band, said tension being in a predetermined amount corresponding to a hydraulic pressure applied to said second chamber at which said first and second shells separate;

affixing said elastic clamping band to said first and second shells to overlie the edges of said open ends; and

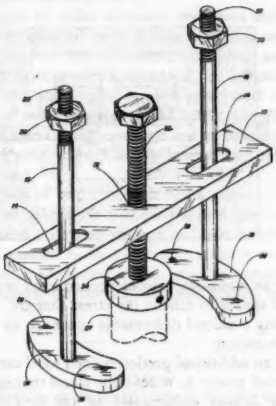
disengaging said opposite ends of said affixed clamping band, said affixed clamping band retaining at least a portion of said tension to clamp the shells together, said band stretching substantially only in the direction of its tension along said longitudinal axis when hydraulic fluid pressure in excess of said predetermined amount of tension is applied to said second chamber to permit said shells to separate.

4,492,014

JET ENGINE COMPRESSOR STAGE PULLER

Billy R. Alexander, Little Rock, Miss., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 8, 1983, Ser. No. 483,458
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—259 1 Claim



1. A compressor stage puller comprising:

a guide bar having a central threaded hole and a slot extending though said guide bar and situated symmetrically one on each side of said central threaded hole extending radially from said central threaded hole;

a bolt threaded through said central threaded hole having a cup attached to the end, said cup being configured to securely fit on the end of a compressor shaft;

a guide rod extending through said slot and capable of being moved along said slot, said guide rod having a nut threaded on one end and a base shoe attached to the other end, said base shoe being configurated to fit under the interior diameter of a compressor stage; and

means for attaching an alternate shoe to said guide rod, said alternate shoe being arcuately shaped, having a central hole through which said guide rod passes, and having means for attachment to said base shoe so that said alternate shoe is used when necessary to compensate for different interior diameters of successive ones of said compressor stages;

whereby downward movement by said bolt causes said cup to exert downward force on said compressor shaft which in turn results in upward force by said base shoe on said compressor stage to free said compressor stage.

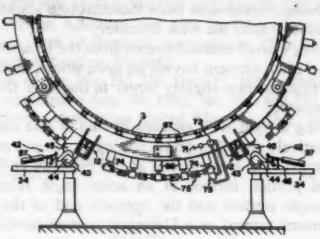
4,492,015

APPARATUS FOR USE IN WELDING

Timothy C. Dearman, P.O. Box 937, Pearland, Tex. 77581

Filed Jun. 24, 1982, Ser. No. 391,980
Int. Cl.³ B23K *37/04*
U.S. Cl. 29—281.5 32 Claims

1. Apparatus for use in welding a first annular member having a free end to a second annular, substantially coaxial member having a free end adjacent and confronting the free end of the first member, said apparatus comprising a first annular clamp for applying a clamping force on one of said members adjacent its free end; a second annular clamp substantially coaxial with said first clamp for applying a clamping force on the other of said members adjacent its free end; support means carried by said first clamp and supporting said second clamp in axially spaced, substantially parallel relation relative to said first clamp; a base; and means mounting said first clamp on said



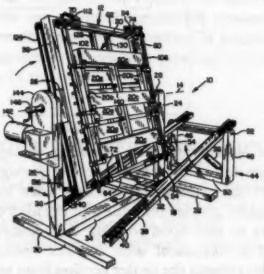
base for conjoint swinging movement of said first and second clamps relative to said base.

4,492,016

PALLET ASSEMBLY APPARATUS AND METHOD

John E. Smets; John S. Smets; Robert D. Smets, all of Lake Oswego, and Barry K. Massinger, Portland, all of Oreg., assignors to Smetco, Inc., Portland, Oreg.

Filed Sep. 16, 1982, Ser. No. 418,611
Int. Cl.³ B23P *11/00*
U.S. Cl. 29—432 18 Claims



1. An apparatus for assembling pallets comprising:

an assembly table pivotable on an axis;

means mounted to said table for supporting a plurality of first deck boards in a first common plane which is initially inclined upwardly;

means mounted to said table for supporting a plurality of stringers placed loosely and abuttingly retained over the first deck boards;

means mounted to said table for supporting a plurality of second deck boards placed in a second common plane over the loosely held stringers and first deck boards; whereby said second deck boards are fastened to said stringers, said table is pivoted on said axis to invert said table, and said first deck boards are fastened to said stringers.

4,492,017

METHOD OF ASSEMBLING A RIGID WIRE FOR DRIVEN ROTATIONAL MOVEMENT

Bruce B. Latter, Anchorage, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jun. 16, 1982, Ser. No. 388,808
Int. Cl.³ B23P *11/00*
U.S. Cl. 29—434 5 Claims

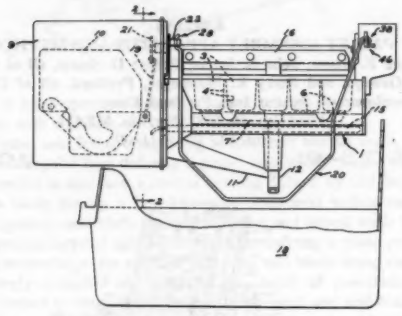
1. A method of assembling a rigid wire element of generally

circular cross section for driven rotational movement comprising:

attaching a rotational element to a drive means, said element having a transverse bore therethrough slightly larger in diameter than the wire diameter;

locating a pivot element spaced from the rotational element, said pivot element having an open slotted aperture with a bottom portion slightly larger in diameter than the wire diameter;

forming a rigid wire element having at one end thereof a relatively straight portion having at one end an integrally formed stop element and at the opposite end a terminal end portion formed at an acute angle relative to the straight portion and the opposite end of the rigid wire element formed as a U-shaped portion having two legs interconnected by a center section with a reduced diameter having two flat opposed sides joined by two arc-shaped opposed sides with the two flat opposite sides having a slightly less dimension than the slot opening of



the slotted aperture, allowing passage of the reduced diameter of the center section through the slot opening and the arc-shaped opposed sides having a dimension slightly greater than the slot opening of the slotted aperture so that upon rotating the reduced diameter section out of alignment with the slot opening the arc-shaped sides prevent the center portion from withdrawal from the slotted aperture through the slot opening;

assembling said three elements by;

inserting the terminal end portion of said one end of the rigid wire element through the rotational element tranverse bore;

then rotating the rigid wire element to orient the substantially straight portion parallel to the bore in the rotational element said integrally formed stop element and terminal end portion cooperating to prevent withdrawal of the straight portion from the bore; and

then inserting the center section of the U-shaped portion of the rigid wire element into the slotted aperture of the pivot element.

4,492,018

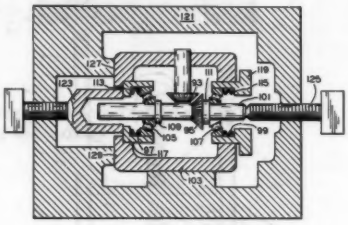
METHOD OF AXIALLY POSITIONING A ROTATING ANNULAR MEMBER SUPPORTING SHAFT WITHIN A SUPPORT

John E. Rode, Albany, N.Y., assignor to Temper-Ring Equipment Corporation, Fonda, N.Y.

Filed Aug. 13, 1982, Ser. No. 407,992
Int. Cl.³ B67B *7/30*
U.S. Cl. 29—437 **14 Claims**

1. The method of accurately and quickly axially positioning a rotating annular member supporting shaft within a support for rotation therein with predetermined axial bearing clearance independent of member and support dimensional variations and with the annular member axial location relative to the support being a critical dimension comprising the steps of:

correctly axially positioning the member relative to the support by engaging the support and moving the shaft axially to properly position the annular member in the support in accordance with the critical dimension and by doing so, compressing a first deformable spacer to its desired final axial dimension;



imparting an additional predetermined axial compression to the first spacer to relieve the stress therein;

compressing a second deformable spacer to its desired final axial dimension;

imparting an additional predetermined axial compression to the second spacer to relieve the stress therein; and

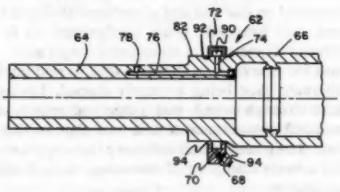
precluding further deformation of the first spacer while deforming the second spacer.

4,492,019

METHOD OF FORMING AN AXLE

Calvin G. Wells, and Steven B. Szabo, both of Warren, Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jun. 30, 1983, Ser. No. 509,580
Int. Cl.³ B23P *11/02*
U.S. Cl. 29—447 **6 Claims**



1. A method of forming an axle of the type which includes a central portion with a pair of hollow spindles welded at opposite ends thereof, each of said spindles being capable of receiving a rotatable hub thereon for support of a wheel and tire, said hub including an intermediate cavity which is sealed to define with a wall of said spindle a reservoir for inflation air for said tire, said spindle being capable of being coupled at a region axially inwardly of said hub at a predetermined circumferential location thereon to a central tire inflation system to provide said inflation air for said reservoir, said method comprising the steps of:

providing a central portion of said axle;

providing a pair of spindles with each said spindle having a cylindrical outer surface at said region;

forming an axially extending passage in said wall of said spindle beginning at an interior surface thereof and terminating in alignment with said intermediate cavity of said hub;

forming a first radially extending passage from said cylindri-

cal outer surface to terminate at said axially extending passage;

forming a second radially extending passage in said wall of said spindle to connect said axially extending passage with said reservoir;

sealing said axially extending passage at said interior surface;

welding each of said spindles respectively to said opposite ends of said central portion;

forming a pair of collar elements, each said collar element having a cylindrical inner surface matching said cylindrical outer surface of said spindle, a coupling passage and a fitting for mating with said central tire inflation system;

forming a circumferential groove in at least one of said cylindrical outer surface of said spindle intersecting said first radially extending passage and said cylindrical inner surface of said collar element intersecting said coupling passage; and

installing each of said collar elements respectively on said cylindrical outer surface of each of said spindles with said first radially extending passage and said coupling passage being connected by said circumferential groove and said fitting being positioned at said predetermined circumferential location for mating with said central tire inflation system.

4,492,020

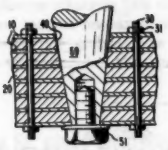
METHOD FOR FABRICATING CORRUGATED MICROWAVE COMPONENTS

Jack M. Cobb, San Juan Capistrano, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Sep. 2, 1982, Ser. No. 414,222

Int. Cl.³ H01P *11/00*; H01Q *13/02*

U.S. Cl. 29—600 **11 Claims**



1. A method for fabricating corrugated microwave components, said method comprising the steps of:

sandwiching a plurality of layers of chemically removable spacer material alternately with electrically conductive plates which are movable in relation to each other to form a billet, the billet having an outside surface;

clamping the layers of the billet to prevent relative movement thereof with a first clamping means disposed adjacent and inwardly of the outside surface;

forming a tapered hole through the billet;

inserting in said hole a mandrel having substantially the same taper as the hole and a maximum diameter greater than that of the hole;

adjusting a second clamping means operatively secured to the small end of the tapered mandrel for urging the layers towards the large end of the mandrel so as to clamp the plates and the spacer material in fixed positions relative to each other;

then reshaping the outside surface of said billet and removing the first clamping means;

plating said reshaped outside surface with an electrically conductive material to form a connecting means between the electrically conductive plates;

removing said mandrel and second clamping means; and

chemically removing said spacer material.

4,492,021

METHOD OF MAKING CATHODE CURRENT COLLECTORS FOR SODIUM SULPHUR CELLS

Michael L. Wright, Allestree, and Alec R. Tilley, Blackbrook, near Belper, both of England, assignors to Chloride Silent Power Limited, London, England

Continuation of Ser. No. 217,334, Dec. 17, 1980, abandoned. This application Aug. 16, 1982, Ser. No. 408,573

Claims priority, application United Kingdom, Dec. 24, 1979, 7944348

Int. Cl.³ H01M *6/00*

U.S. Cl. 29—623.1 **24 Claims**

1. In a method of making a cathode current collector for a sodium sulphur cell comprising forming a collector of a conductive metal and coating the metal with a corrosion resistant material, wherein the improvement consists of covering at least that part of the surface of the collector exposed to a corrosive material, with a material consisting of graphite foil and subjecting the assembly to isostatic pressing to force the graphite foil to adhere to said surface.

4,492,022

APPARATUS FOR THE PAIRED CONNECTION OF SHEET PILES WITH CLAWS

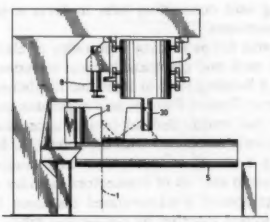
René Graas, Esch, and Michel Fackelstein, Niedercorn, both of Luxembourg, assignors to Arbed S.A., Luxembourg

Filed Aug. 9, 1982, Ser. No. 406,280

Claims priority, application Luxembourg, Aug. 12, 1981, 83549

Int. Cl.³ B23P *23/00*; E02D *13/04*

U.S. Cl. 29—787 **11 Claims**



1. Apparatus for the paired connection of sheet piles with claws, the apparatus comprising:

first bed means in a first section and second bed means in a second section;

said bed means having a common longitudinal axis;

first alignment means associtaed with said first bed means for defining a first alignment edge in said first section;

second alignment means associated with said second bed means for defining a second alignment edge in said second section;

first positioning means for positioning a first pile in said first section against said first alignment edge, the pile having a first claw on said common axis;

second positioning means for positioning a second pile having an edge claw in said second section against said second alignment edge, the pile having a second claw on said common axis; and

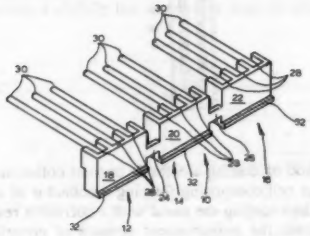
means for moving the pile in one section relative to the pile in the other section to interengage the claws of each pile on the common axis to form a joined pair of piles.

4,492,023

ELECTRICAL HARNESS FABRICATION METHOD AND APPARATUS

Thomas E. Schneider, Burbank, and Jack F. Funcik, Downers Grove, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Sep. 24, 1982, Ser. No. 422,867
Int. Cl.³ H01R *43/04*; B23P *19/00*
U.S. Cl. 29—861 **13 Claims**



4. A method of producing a plurality of electrical harnesses, each harness including a connector defined by a housing with at least one insulation displacement type contact loaded therein, said method comprising the steps of:

(a) feeding a set of interconnected connectors spaced predetermined distances from each other by connecting tabs to a first station,

(b) positioning a plurality of wires in alignment with at least one contact of each connector at a second station remote from said first station,

(c) moving said set of interconnected connectors to said second station with at least one contact of each connector in alignment with a wire disposed at said second station,

(d) simultaneously inserting an aligned wire into at least one aligned contact of each connector, and

(e) removing said connecting tabs to form a plurality of separate harnesses.

9. An apparatus for producing a plurality of electrical harnesses wherein each said electrical harness includes a connector defined by a housing with at least one insulation displacement type contact loaded therein, said apparatus comprising:

a connector feed station defined on said apparatus,

means operatively associated with the connector feed station for feeding a set of connectors to said connector feed station wherein said set of connectors includes a plurality of housings spaced predetermined distances from each other and joined together by connecting tabs,

a second station defined on said apparatus spaced from and operatively associated with said connector feed station,

means operatively associated with said connector feed station and said second station for moving said set of connectors from said connector feed station to said second station,

means operatively associated with said second station for simultaneously inserting a wire into at least one of said insulation displacement type contacts of each connector, and

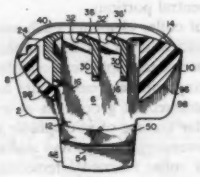
tab removing means operatively associated with said tabs after wire insertion for removing said connecting tabs to separate said set of connectors into a plurality of independent harnesses.

4,492,024

RAZOR BLADE ASSEMBLY

Chester F. Jacobson, Southboro, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Sep. 17, 1982, Ser. No. 419,202
Int. Cl.³ B26B *21/22*
U.S. Cl. 30—87 **4 Claims**



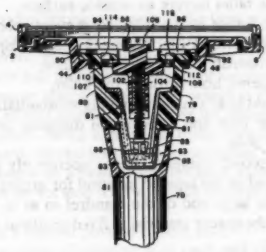
1. A razor blade assembly comprising a leading blade member having a first cutting edge and a following blade member having a second cutting edge, said cutting edges being parallel with each other and facing a same direction to act in tandem upon a surface being shaved, said leading and following blade members being disposed between guard and cap portions adapted in operation to engage said surface being shaved ahead of and behind, respectively, said first and second cutting edges, said leading and following blade members and said guard portion being movable independently of the remainder of said blade assembly and independently of each other in response to forces encountered during a shaving operation, the blade assembly having pivot mounting means thereon for pivotal attachment to a razor handle assembly, the blade assembly, as a whole, being pivotally movable on said handle assembly in response to forces encountered during the shaving operation, and a cam means on said assembly adapted to receive a biasing means disposed in said handle assembly and adapted to exert a yieldable biasing force on said pivotally movable blade assembly, whereby to maintain maximum contact between said surface being shaved and said leading and following independently movable blades and said independently movable guard portion.

4,492,025

RAZOR HANDLE ASSEMBLY

Chester F. Jacobson, Southboro, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 419,203, Sep. 17, 1982,. This application Sep. 29, 1983, Ser. No. 537,073
Int. Cl.³ B26B *21/52*
U.S. Cl. 30—87 **2 Claims**



1. A razor handle assembly comprising a grip portion, a head portion at one end of said grip portion, the head portion having first and second arms movable toward and away from each other, a first shell bearing mounted on said first arm and a second shell bearing mounted on said second arm, said shell

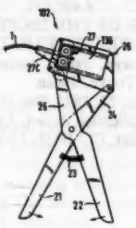
bearings being adapted to receive a razor blade assembly and to permit pivotal movement of said razor blade assembly on said handle assembly, a spring-biased plunger disposed in said head portion and extending between said first and second shell bearings, said plunger being reciprocally movable in said head portion, a free end of said plunger being adapted to engage an underside cam portion of said blade assembly to exercise a bias on said blade assembly and thereby urge said blade assembly to a given position on said shell bearings, first and second extensions protruding outwardly from said plunger, a detent upstanding from each of said extensions, each of said shell bearings having an opening therein adapted to receive, respectively, said detents, said spring being adapted to urge said detents into said openings when said arms are moved toward each other, to lock said arms in close proximity to each other, engagement of said plunger with said blade assembly being operative to remove said detents from said openings to permit said arms to move away from each other and said shell bearings to engage said blade assembly.

4,492,026

CONDUCTOR SEPARATOR

Hans Wiener, Ingmarsö, and Hans Undin, Åkersberga, both of Sweden, assignors to C. A. Weidmüller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,404
Claims priority, application Sweden, Mar. 15, 1982, 8201600
Int. Cl.³ B21F *13/00*
U.S. Cl. 30—90.9 **18 Claims**



1. Apparatus for separating conductors in a multiple-conductor flat ribbon cable having an insulating sheathing with longitudinal score lines between each pair of adjacent conductors embedded in the sheathing, said apparatus comprising, in combination:

(a) means for longitudinally feeding said cable through the apparatus and for cutting said sheathing thereof along each said score line, said means being rotatable about an axis of rotation which is perpendicular to the length direction of said cable when inserted into the apparatus, said means being provided with a plurality of protruding cutting edge means spaced one from another by the same distance as said score lines on the sheathing are spaced one from another, each cutting edge means having an arcuate operational edge section with the circumferential shape of a circular arc having its radius of curvature centered on said axis of rotation and extending over less than a full circle between two end points, the remaining part of the periphery of the cutting edge means between the said two end points being defined by an indrawn, non-cutting edge section which at each point thereon is spaced from said axis of rotation less than the length of said radius;

(b) cable support means adjacent said sheathing cutting means having a smooth surface devoid of cutting edge means and adapted to press a flat ribbon cable inserted into the apparatus against said arcuate operational edge sections of the cutting edge means in order to effect feeding of said cable and cutting of said sheathing and to relieve said cable from said non-cutting edge sections and providing in cooperation with said indrawn non-cutting sections a feed-in and feed-out gap having a width greater than a maximum thickness of said cable; and

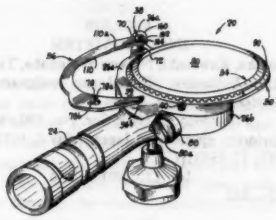
(c) drive means for rotating said sheathing cutting means at least one full turn.

4,492,027

ROTARY HAND KNIFE

Louis A. Bettcher, Amherst, Ohio, assignor to Bettcher Industries, Inc., Birmingham, Ohio

Continuation-in-part of Ser. No. 318,386, Nov. 5, 1981, Pat. No. 4,439,924. This application Apr. 18, 1983, Ser. No. 485,738
Int. Cl.³ A22C *17/04*
U.S. Cl. 30—276 **15 Claims**



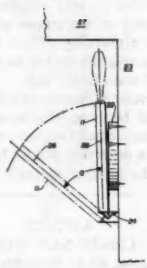
1. A handpiece for a hand knife for cutting meat or the like, comprising a handle portion adapted to be grasped by an operator, a portion for supporting a ring-like blade housing and blade, and a recess in the handpiece for a pinion gear that drives the blade in rotation, the recess opening through a surface of the handpiece that provides a seat for the blade housing, said recess having an outward flare at one side only of said opening.

4,492,028

WALL MOUNTED KNIFE HOLDER

John Bourgein, 2660 Union St., Oakland, Calif. 94607

Filed Nov. 15, 1982, Ser. No. 441,671
Int. Cl.³ A47F *5/08*
U.S. Cl. 30—296 A **1 Claim**



1. A wall mounted cutlery holder which can be used on a wall directly below a cabinet comprising in combination:

a housing defining a narrow slot for receiving a plurality of cutlery knives, wherein said slot is wide enough to receive the blade of a knife and narrow enough to block the passage of a knife handle whereby a knife inserted into said housing slot will have the blade protected within the housing and its handle protruding from said housing;

a securing member for attachment to a wall, said securing member connected to said housing by hinge means whereby when said securing member is attached to a wall

said housing can pivot between a first position in which the longitudinal axis of the slot in said housing is generally vertical whereby cutlery in the slot will be parallel to the wall and a second position in which the longitudinal axis of the slot wil be at an angle of between 30 degrees and 90 degrees from vertical and the wall; and

housing position means selectively holding said housing in either its first position or its second position, whereby in its first position cutlery is conveniently stored in said housing parallel to a wall to which said securing member may be attached even if said wall is immediately below a cabinet, and further whereby in its second position cutlery is easily removable from and insertable into said housing due to the angle of the slot axis relative to the wall and any overhanging cabinetry.

4,492,029

INCLINOMETER

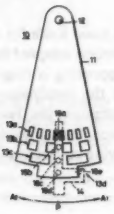
Osamu Tanaka, Kawasaki; Noboru Watanabe, Tokyo, and Hiroshi Iiyama, Yokosuka, all of Japan, assignors to Jeco Company Limited, Kawasaki, Japan

Filed May 2, 1983, Ser. No. 490,666

Claims priority, application Japan, May 6, 1982, 57-65978[U]; Jun. 9, 1982, 57-85631[U]

Int. Cl.³ G01C 9/06

U.S. Cl. 33—366 **10 Claims**



1. An inclinometer comprising:

a weight pivotally supported on a main body which may become inclined, said weight being of a sectoral shape and being relatively rotatable with respect to said main body and constantly hanging vertically due to gravity regardless of an inclination of said main body;

a code part provided on said weight, said code part consisting of a plurality of sequences of code elements which correspond to a plurality of bits based on a Gray code according to a relative rotary angle of said weight with respect to said main body; and

a detecting part which becomes inclined together with said main body and becomes displaced with respect to said weight along each of said sequences of said code elements, for producing a detection output based on the Gray code according to the inclination angle of said main body.

4,492,030

CHAIN SAW BARS

Cornelis J. M. Beerens, 40-42 Berkshire Rd., North Sunshine, Victoria, Australia

Filed Aug. 18, 1982, Ser. No. 409,308

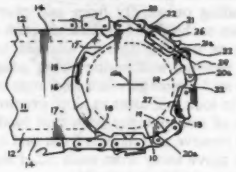
Claims priority, application Australia, Aug. 24, 1981, PF0391; Aug. 29, 1981, PF0949; Dec. 30, 1981, PF2105

Int. Cl.³ B27B 17/00

U.S. Cl. 30—384 **15 Claims**

15. In a chain saw comprising a chain saw bar having opposite longitudinal edges each comprising a central longitudinal guide groove and a longitudinal support surface on each side of the guide groove, and a chain adapted to travel about the periphery of the bar, said chain having a plurality of alternate equi-spaced cutter links having a cutting edge, connector links, and a drive link pivotally connecting each cutter link to the adjacent connector links, said cutter and connector links each having inner edge faces that slidably engage the support surfaces of the bar and each drive link having an inwardly extending tongue that is received in the guide groove, the improvement comprising:

a support member mounted on one end of the bar for rotation in the plane of the bar,



a peripheral edge on said support member to support the chain as it passes from one edge of the bar to the opposite edge, said peripheral edge of the support member being constructed to guide the pivot points of the cutting links on a circumferential path of a first smaller radius and the pivot points of the connecting links on a circumferential path of a second radius, said first radius being smaller than the second radius whereby kickback of the chain saw is minimized.

4,492,031

VERNIER DEVICE OF THE DIGITAL DISPLAY TYPE FOR A UNIVERSAL PARALLEL RULER

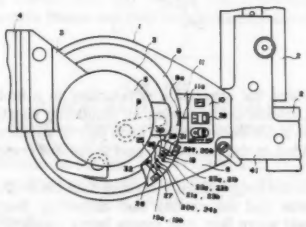
Masao Koenuma, Tokyo, Japan, assignor to Asahi Seimitsu Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1982, Ser. No. 370,152

Claims priority, application Japan, Apr. 21, 1981, 56-59973

Int. Cl.³ B43L 13/08

U.S. Cl. 33—1 PT **8 Claims**



1. Angular position indicating means for a universal parallel ruler, said ruler comprising support means having a stationary portion and a rotatable portion rotatable with respect to said stationary portion, said indicating means comprising;

a first protractor comprising a plurality of visually perceptible graduations on one of said stationary and rotatable portions and a cooperating index on the other of said stationary and rotatable portions, wherein said visually perceptible graduations are spaced at first angular intervals for indicating a first angular measurement;

a second protractor mounted on one of said stationary and rotatable portions and comprising a plurality of first apertures spaced at said first angular intervals, said second protractor also comprising a cutaway sector coextensive with said first apertures for an angle of 180° for detecting the direction in which said rotatable portion is rotated with respect to said stationary portion;

a vernier protractor mounted on the other of said stationary and rotatable portions in juxtaposition to said second protractor, said vernier protractor comprising a plurality

of second apertures spaced at second angular intervals, and also comprising discrimination means cooperating with said cutaway sector for detecting said direction in which said rotatable portion is rotated with respect to said stationary portion;

detecting means for detecting coincidence of one of said first apertures with one of said second aperatures; and

digital display means responsive to said detecting means for displaying a second angular measurement smaller than said first angular measurement.

4,492,032

COUPLING ARRANGEMENT FOR LENGTH MEASURING DEVICE

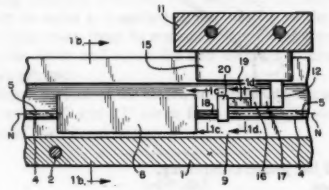
Günther Nelle, Bergen, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jan. 20, 1983, Ser. No. 459,375

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1982, 3201887

Int. Cl.³ G01B *11/02*

U.S. Cl. 33—125 R **18 Claims**



1. In a length measuring device for measuring the relative position of first and second objects, of the type comprising a measuring scale which defines a measuring direction, means for connecting the scale to the first object, a scanning unit, and means for guiding the scanning unit along the scale independently of movement of the second object transverse to the scale, the improvement comprising:

a coupling apparatus arranged to interconnect the scanning unit and the second object and to transmit movement of the second object in the measuring direction to the scanning unit; and

a linear guide, included in the coupling apparatus and having two degrees of translatory freedom in first and second directions perpendicular to the measuring direction, said linear guide connected between the scanning unit and the second object such that the scanning unit is movable with respect to the second object in a plane perpendicular to the measuring direction.

4,492,033

LINEAR SCALE TYPE DISPLACEMENT MEASURING INSTRUMENT

Souji Ichikawa, Kanagawa, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1983, Ser. No. 481,788

Claims priority, application Japan, Apr. 7, 1982, 57-57604

Int. Cl.³ G01B *11/04*

U.S. Cl. 33—125 C **6 Claims**

1. A linear scale type displacement measuring instrument comprising:

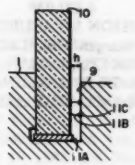
a hollow elongate case including a reference surface and connected to one of two workpieces, between which a relative displacemnt is to be measured;

a main scale guided by said reference surface and made of a material having a coefficient of thermal expansion different from that of said elongate case;

elastic members arranged in a longitudinal groove of said elongate case for urging said main scale to said reference surface so as to hold said main scale in said longitudinal groove; and

an index scale connected to the other of said two workpieces to be measured and movable along said main scale;

wherein said relative displacement between said two workpieces to be measured is measured from a relative movement between said main scale and said index scale, characterized in that there are provided in the longitudinal direction of said main scale, elastic member non-joining portions each having a predetermined pitch and a length according to the material qualities of said main scale, said elongate case and said elastic members, and the length of said main scale, whereby a thermal stress acting on said main scale through the elastic members at the time of a temperature change is reduced.



4,492,034

DISPLACEMENT MEASURING DEVICE

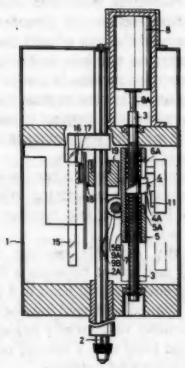
Shingo Nishina; Seigo Takahashi, and Shigeru Ohtani, all of Kanagawa, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1982, Ser. No. 450,767

Claims priority, application Japan, Dec. 18, 1981, 56-205911

Int. Cl.³ G01B *7/02*

U.S. Cl. 33—170 **16 Claims**



1. A displacement measuring device wherein a measuring element slidably supported on a main frame is provided and the length or the like of a work to be measured is measured from a displacement value of said measuring element when the forward end of said measuring element is abutted against said work to be measured, characterized in that there are provided: a feed screw shaft; an internally threaded member threadably coupled onto said feed screw shaft; a cylinder housing surrounding said internally threaded member, loosely coupled onto said feed screw shaft and permitting a projecting portion of said internally threaded member to project outwardly therefrom and move relative thereto within a predetermined range; and constant load springs interposed between opposite ends of

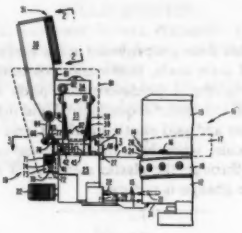
said internally threaded member and opposing inner ends of said cylinder in the axial direction of said feed screw shaft and within said cylinder, for constantly biasing said internally threaded member to a neutral position; and further, said portion projecting from the cylinder, of the internally threaded member is interlocked with said measuring element through said constant load springs and said cylinder.

4,492,035

HEAD PROTRUSION MEASURING STRUCTURE

Peter D. Doninelli, Morgan Hill, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Feb. 18, 1983, Ser. No. 467,629
Int. Cl.³ G01B 3/22
U.S. Cl. 33—172 B **11 Claims**



1. For use with a rotating cylindrical guide drum assembly on which is mounted a brittle magnetic transducing head having a safe pressure loading range for engaging a magnetic tape supported by the drum assembly in a helical path, a gauge structure for measuring the radial protrusion of the head from the drum assembly, comprising:

a base for positioning said gauge structure in predetermined radial relation to said drum assembly;

a bearing member extending from said base for generally radial motion in first and second directions respectively away from and toward the axis of said drum assembly;

a gauge means mounted on said base and adapted for urging said bearing member for motion in one of said directions and for providing an indication representing the position of said bearing member with respect to said base; and

means for urging said member for motion in the other direction opposite to said one direction;

said urging means and said gauge means being arranged to produce a maximum net pressurizing effect within said safe loading range for urging said member in said second direction toward said axis;

said generally radially movable bearing member being adapted for radial movement between a first position of tangential engagement with said head in a first position of said head radially aligned with said member, and a second position of said member tangentially engaging said drum assembly, when said head is in a second position circumferentially remote from said member;

said gauge means being adapted for pressurizing said bearing member for motion in one of said directions from one of said positions thereof toward the other position thereof and for providing an indication representing the distance moved by said bearing member from said one to the other position thereof;

said urging means including a pin member mounted for axial rotation on said base, a coil spring mounted co-axially on said pin and having extending ends, a first of said ends being secured to said pin and the second of said ends extending to engage and to urge said bearing member in said second direction toward said drum axis, said pin being axially rotatable to variably adjust the urging force of said coil spring, and setscrew means threaded into said base and peripherally engaging said pin to clamp said pin in a chosen position; and

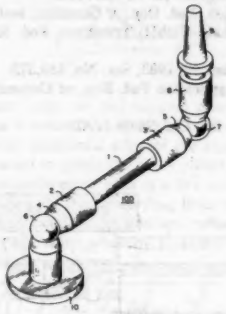
said urging means and said gauge means being arranged to produce a minimal net pressurizing effect urging said member in the second direction toward said axis.

4,492,036

MAGNETIC BALL BAR GAUGE

Walter L. Beckwith, Jr., Warwick, R.I., assignor to Brown & Sharp Manufacturing Company, North Kingstown, R.I.

Filed Jan. 11, 1984, Ser. No. 569,997
Int. Cl.³ G01B 5/25
U.S. Cl. 33—180 R **12 Claims**



1. A ball bar gauge comprising,

a rigid bar,

a pair of tooling balls,

a magnetic chuck attached to each end of said bar, each of said chucks engaging one of said tooling balls, each of said chucks comprising;

a permanent magnet having a plurality of pole faces;

means for attaching said magnet to said bar; and

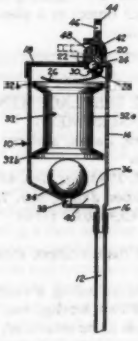
means for rigidly holding said tooling ball proximate to said magnet so that said ball will be attracted and removably held by said magnet.

4,492,037

LIQUID LEVELING DEVICE

Norman H. Flis, Box 132, R.D. #7, Gibsonia, Pa. 15044

Filed Dec. 7, 1983, Ser. No. 558,903
Int. Cl.³ G01C 5/04
U.S. Cl. 33—367 **5 Claims**



1. A liquid control assembly for use in combination with a liquid leveling device including a transparent flexible hose, comprising:

a hollow closed body elongated along a central axis which is normally vertically oriented during use and having a lower end with an opening in sealed liquid-flow communication with an end of the hose whereby the closed body projects above the hose end during use of the leveling device;

the upper end of the closed body having an air passage therethrough permitting communication between the interior of the closed body and the atmosphere during use of the leveling device;

valve structure operatively associated with the air passage to open and close the air passage, comprising a ball member adapted to sealably register with the air passage, a pivotally mounted lever projected into the closed body and adapted to urge the ball member into registration with the air passage, and a float member disposed centrally within the closed body to pivot the lever and thereby cause the ball member to close the air passage when sufficient liquid flows from the hose into the closed body;

the closed body having an inner sloped surface converging towards the opening connected with the end of the hose, a spherical member normally resting on the converging surface over the opening to the hose, and the float member being disposed between the spherical member and the lever in order to translate rolling motion of the spherical member away from its normal position and thereby actuate the lever and cause the ball member to close the air passage; and

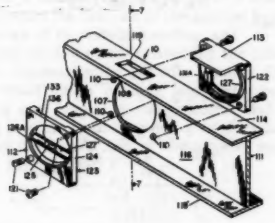
the sloped surface of the closed body constituting an angle of between 22° and 27° taken from a line transverse to the axis of the closed body.

4,492,038

TOP-VIEW-READING LEVEL

Daniel J. Mayes, Johnson City, Tenn., assignor to Great Neck Saw Manufacturing, Inc., Mineola, N.Y.

Filed Apr. 7, 1983, Ser. No. 482,873
Int. Cl.³ G01C 9/28
U.S. Cl. 33—379 **4 Claims**



1. A level vial assembly for use on a level frame having a web with a vial opening in the web and a cut away portion forming a recess extending to one edge of said web,

said vial assembly comprising:

a vial support and a window support,

said vial support having a relatively flat web engaging surface,

a recess in said vial support extending through said relatively flat web engaging surface a substantial distance and adapted to receive a window member and a locating ring on said surface extending therefrom and adapted to be received in said vial opening in said web,

said window support having a relatively flat web engaging surface and a locating ring attached to said flat surface extending therefrom and adapted to extend into said vial opening from the side thereof opposite said vial support,

a window member integrally attached to said window support and adapted to extend through said cut away adjacent said vial opening into said recess in said vial support,

means for securing said parts together as an assembly and to said level frame,

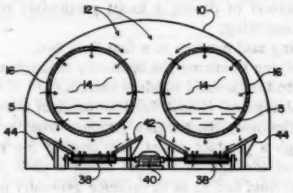
whereby a person viewing said vial assembly through said window member can observe said vial to determine the position of a bubble in said vial.

4,492,039

METHOD AND APPARATUS FOR DRYING AND HANDLING SLUDGE

Allen C. Chao, 1301 DeBoy St., Raleigh, N.C. 27606; Barney K. Huang, 3332 Minor Ridge Dr., Raleigh, N.C. 27603, and James S. J. Wang, 1309 Seabrook Ave., Cary, N.C. 27511

Filed May 10, 1983, Ser. No. 493,213
Int. Cl.³ F26B 3/28, 11/02
U.S. Cl. 34—4 **12 Claims**



1. An apparatus for drying and handling sludge comprising:

A. a rotary drying chamber having a pair of ends and a side wall and adapted to receive sludge;

B. said side wall including a plurality of generally uniformly spaced perforations formed from one end of said drying chamber to the other end with said perforations being formed over substantially the entire area of said side wall;

C. means for drying the sludge within said rotary drying chamber, said drying means including means for generating a system of drying air and directing the system of drying air from outwardly of said rotary drying chamber through said perforations in the side wall of said rotary drying chamber, and into said rotary drying chamber for drying the sludge therein;

D. means for forming the sludge material within said rotary drying chamber into relatively short spaghetti-like sludge portions and expelling the sludge in the form of said spaghetti-like sludge portion from said rotary drying chamber, said means for forming the sludge into said relatively small sludge-like portions and expelling the same from said rotary drying chamber including means for rotating said rotary drying chamber and moving the sludge therein from one portion of the drying chamber to another as said rotary drying chamber is rotated and causing the sludge within the drying chamber to be impacted against the side wall of the drying chamber so as to force the sludge outwardly from said drying chamber through said perforations formed in the side wall of said drying chamber which in turn forms the spaghetti-like sludge portions which project outwardly from the side wall of said drying chamber as the same is rotated; and

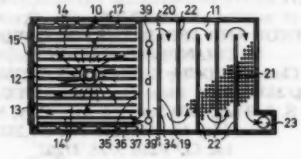
E. means for directing the system of generated drying air into actual drying contact with said spaghetti-like sludge portions projecting outwardly from said side wall of said drying chamber while said spaghetti-like sludge portions actually project from said drying chamber so as to actually dry the formed spaghetti-like sludge portion while they project from said drying chamber as the same is rotated.

4,492,040

METHOD AND APPARATUS FOR DRYING A PULVERULENT OR PARTICULATE PRODUCT

Uffe L. Jensen, Vanlose, and Sten Mortensen, Vaerlose, both of Denmark, assignors to A/S Niro Atomizer, Soborg, Denmark

Filed Nov. 18, 1981, Ser. No. 322,707
Claims priority, application Denmark, Nov. 20, 1980, 4964/80
Int. Cl.³ F26B *3/08, 17/00*
U.S. Cl. 34—10 **13 Claims**



1. A method of drying a moist particulate product, said method comprising;

(a) feeding said product to a first fluid bed,

(b) supplying fluidizing gas upwardly through said first bed so as to fluidize said product therein,

(c) supplying heat to said fluidized product in said first bed,

(d) continuously discharging product from said first bed through a product outlet, and passing the product discharged through said outlet along a path defined in a second fluid bed so as to produce generally plug flow,

(e) predetermining said path so that the moisture content of said particulate product encompasses the constant rate drying-falling rate drying region,

(f) controlling said heat supply to the product in said first bed in response to the temperature of said product at least at one location along said path so as to obtain a desired degree of dryness of said product discharged through said outlet substantially free of unbound moisture, and

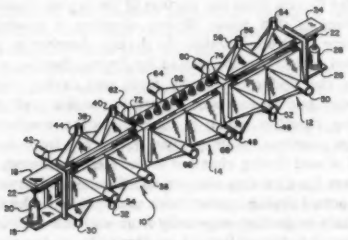
(g) wherein the product temperature varies and passes a minimum while the product travels along said path on said second bed, said one location being positioned downstream of the location at which said minimum temperature is reached.

4,492,041

CURING CHAMBER WITH CONSTANT GAS FLOW ENVIRONMENT AND METHOD

Maher L. Mansour, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jul. 25, 1983, Ser. No. 516,978
Int. Cl.³ F26B *5/04, 3/00, 25/00*
U.S. Cl. 34—15 **13 Claims**



8. A method for maintaining a constant gas environment in a chamber wherein moving objects can be passed through said environment, said chamber housing said constant gas flow environment being in open communication with the ambient outside, comprising:

admitting said gas flow into a central interior gas flow zone through a gas flow inlet means and withdrawing said gas flow from said central gas flow zone by outlet means which is oppositely disposed from said inlet means, said central gas flow zone further containing flow control means which are maintained to establish ostensibly transverse laminar gas flow between said inlet means and said outlet means;

applying suction to an inlet zone and to an outlet zone which zones are connected to said central gas zone and are in open communication therewith, said inlet and outlet zones also being in open communication with the ambient atmosphere outside of said chamber, said source of suction being applied to said inlet zone and to said outlet zone adequately to create substantially equal pressures in said inlet and outlet zones, the pressures within each of said inlet and outlet zones being less than ambient atmospheric pressure outside of said chamber;

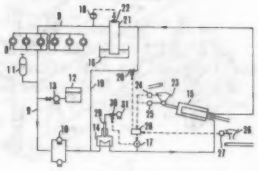
maintaining gas flow conditions at the interface between said interior gas zone and each of said inlet and outlet zones to be substantially preclusive of turbulent flow conditions.

4,492,042

METHOD FOR DRYING COKING COALS TO BE CHARGED IN A COKE OVEN

Norio Otabe; Yoshiaki Shimakawa, and Hiroshi Uematsu, all of Fukuoka, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 26, 1982, Ser. No. 412,523
Claims priority, application Japan, Aug. 28, 1981, 56-134220; Aug. 28, 1981, 56-134221
Int. Cl.³ F26B *3/28*
U.S. Cl. 34—35 **9 Claims**



1. A method for drying coking coals to be charged into a coke oven, which comprises:

(a) recovering the sensible heat from a gas generated in a coke oven with a liquid heating medium, said medium being in a heat exchange relationship with said gas in a heat exchanger;

(b) determining the amount of heat needed to reduce the moisture content of the coking coal to a prescribed value;

(c) heating the heating medium recovered from step (a) to a temperature suitable to reduce the moisture content of the coking coal to said prescribed value;

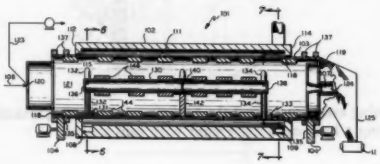
(d) reducing the moisture content of said coking coal to said prescribed value by the use of the heating medium obtained in step (c); and

(e) controlling the temperature of the heating medium prior to introduction into the heat exchanger of step (a) so that the temperature of the heating medium remains lower than its boiling point after heat exchange.

4,492,043
APPARATUS AND METHOD FOR DRYING PARTICULATE MATERIAL

Cristiano Zannoni, Ravenna, Italy, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 1, 1982, Ser. No. 394,213
Claims priority, application Italy, Mar. 26, 1982, 20405 A/82
Int. Cl.³ F26B 3/28
U.S. Cl. 34—39 10 Claims



1. Apparatus comprising:

(a) a housing having a generally cylindrical interior surface and having a first end and a second end;

(b) a rotatable drum having a portion thereof positioned in the housing, a generally annular first chamber being defined between an exterior surface of the drum and the interior surface of the housing, a generally cylindrical second chamber being defined by an interior surface of the drum, said drum having a first end positioned adjacent the first end of the housing a second end positioned adjacent the second end of the housing;

(c) a tubular member having a first end and a second end positioned generally axially in the second chamber, said tubular member extending for a major portion of the length of the second chamber, the interior of the tubular member being at least in substantial isolation from the second chamber;

(d) a first conduit means connecting the tubular member in flow communication with the annular first chamber, said conduit means opening into said tubular member adjacent said tubular member first end for flow of heating medium from adjacent the first end of the annular first chamber to the interior of the tubular member; and

(e) a second conduit means connecting the tubular member in flow communication with the annular first chamber, said conduit means opening into said tubular member adjacent said tubular member second end for flow of heating medium from the interior of the tubular member adjacent the second end of the annular member to the tubular first chamber.

4,492,044
POCKET VENTILATION ROLL BAFFLE ASSEMBLY

Daniel P. Knutsen, Pasco, Wash., assignor to Boise Cascade Corporation, Boise, Id.

Filed Aug. 19, 1983, Ser. No. 524,569
Int. Cl.³ F26B 11/02
U.S. Cl. 34—114 7 Claims

1. In combination with a pocket ventilation roll device adapted for use in drying a paper web and including a stationary horizontal tubular inner core roll and an outer tubular shell roll mounted for rotation in concentrically spaced relation about said inner core roll, said outer shell roll being circumferentially perforated throughout its length, an arcuate portion of said inner core roll containing a plurality of longitudinally arranged perforations, said pocket ventilation roll device being closed at one end, and means for supplying drying air within said inner core roll at the other end of said pocket roll device, whereby air flows longitudinally through said inner core roll, and radially outwardly through the perforations of said inner core and outer shell roll members; baffle means for adjusting the profile of the drying air flow through said pocket ventilation roll device, comprising

(a) a central shaft mounted in spaced relation longitudinally within said inner core roll;

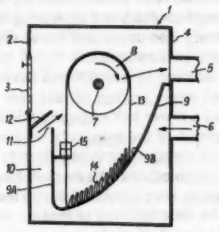
(b) a plurality of air-deflecting baffle members located within said inner core roll and pivotally connected with said shaft at longitudinally spaced intervals for pivotal movement about parallel horizontal axes contained in planes normal to the axis of said central shaft, respectively, each of said baffle members including a planar surface for deflecting the longitudinal flow of air radially outwardly through said inner core roll perforations; and

(c) means for positioning and holding said baffle members at given angular air-deflecting positions relative to said central shaft member, respectively.

4,492,045
APPARATUS FOR DRYING AND STABILIZING PIECES OF WOVEN OR KNITTED FABRIC

Frantz M. J. Boucraut, Troyes, France, assignor to Petit Bateau Valton S.A., Troyes, France

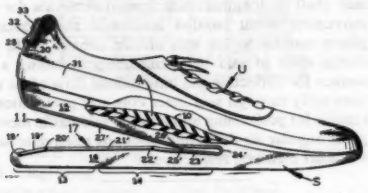
Filed Dec. 2, 1982, Ser. No. 446,272
Claims priority, application France, Dec. 15, 1981, 81 23407
Int. Cl.³ F26B 13/00
U.S. Cl. 34—122 9 Claims



1. Apparatus for drying pieces of woven or knitted fabric formed as an endless loop of material, comprising an enclosed main housing having a front wall and a rear wall, a hatch in said front wall, means for providing dry air, a dry air inlet in said rear wall for passing dry air into the main housing, a moist air outlet in said rear wall, at least one transverse rotatable shaft, means for driving said shaft in rotation, an openwork barrel-shaped drum disposed on said shaft opposite said moist air outlet, said drum supportingly receivable of a first portion of said endless loop of material, a downwardly sloping partition extending from said rear wall at a point below said moist air outlet towards said front wall and having a smooth surface directed towards said drum, at least a portion of said smooth surface being concave toward said drum, said smooth surface being slidingly supportable of a second portion of said endless loop of material formed in regular and natural folds, an upwardly directed channel communicating with said partition, an outlet from said channel situated at a point not higher than the bottom of said drum, and at least one deflector at said outlet directed towards said transverse shaft, said dry air inlet being disposed beneath said partition, whereby, in operation, rotation of said drum causes rotation of said endless loop of material about said drum causing fabric to be lifted from said smooth surface passed over said drum and returned to said smooth surface, said fabric returned to said smooth surface forming regular and natural folds which slide down said smooth sur-

face, while dry air enters through said inlet, passes beneath said partition, upwardly through said channel and channel outlet and passes through said material and said drum and is removed via said moist air outlet.

4,492,046
RUNNING SHOE
Ghenz Kosova, 100 NW. Second Ave., Boca Raton, Fla. 33432
Filed Jun. 1, 1983, Ser. No. 500,242
Int. Cl.³ A43B *13/28*
U.S. Cl. 36—27 **14 Claims**

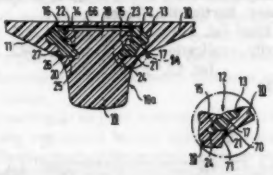


1. In a sole for a running shoe having a sole body of deformable resilient material with:
- a heel-supporting rear segment with top and bottom faces;
- an arch-supporting middle segment extending forward from said rear segment; and
- a ball and toe-supporting front segment extending forward from said middle segment;
- said rear segment having a longitudinal slot extending forward from its rear edge between said top and bottom faces across its complete width and separating said rear segment of the sole body into upper and lower sections;

the improvement which comprises:
- a spring wire received in said slot and having an upper half engaging said upper section of said rear segment of the sole body and a lower half engaging said lower section of said rear segment of the sole body, said upper and lower halves of said spring wire being flexibly and resiliently connected to each other at the front end to bias said upper half of the spring wire upward from its lower half toward the rear of the shoe sole and permit up and down movement of said upper half of the spring wire away from and toward said lower section of said rear segment of the shoe sole;
- said upper and lower halves of the spring wire being flexibly and resiliently connected to each other forward beyond said slot along the opposite sides of said middle segment of the shoe sole.

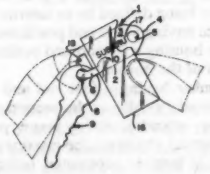
4,492,047
CLEAT FOR SPORTS SHOES
Heino Arff, Hamburg, Fed. Rep. of Germany, assignor to ITW Ateco GmbH, Norderstedt, Fed. Rep. of Germany
Filed Feb. 11, 1983, Ser. No. 465,843
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1982, 3205239; Nov. 18, 1982, 3242606
Int. Cl.³ A43C *15/02, 15/16*
U.S. Cl. 36—134 **17 Claims**

1. A cleat for sports shoes, especially football boots, comprising a socket situated in the outsole, a cleat body, a fastening attachment via which the cleat body is detachably connectible to the socket, and a supporting surface formed at the cleat body which comes to lie in close contact against the outsole from below, characterized in that at least two circumferentially spaced downward pointing mounting surfaces are formed at the fastening attachment and after rotation thereof through a predetermined angle of rotation come to lie in close contact under pressure against supporting surfaces in the socket, with the other supporting surface of the cleat body lying under compression pressure against the outsole and with a means of protection against rotation provided between the



fastening attachment and the socket, said fastening attachment forming a ball and socket joint with said socket.

4,492,048
LABELING KEEPER
Robert A. Brewer, 15 Castle Park Way, Oakland, Calif. 94611
Filed Jun. 8, 1983, Ser. No. 502,333
Int. Cl.³ A44C *3/00*
U.S. Cl. 40—2 R **4 Claims**

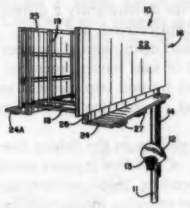


1. A labeling keeper comprising:
- a. an attachment member having a body portion presenting a display surface area which is manufactured from a plastic material selected to receive erasable markings from a writing instrument;
- b. said attachment member includes an extension area adjacent said display surface area formed with an opening having a dimension selected for receiving a portion of an article organizer therethrough;
- c. an arm disposed from said extension area and integrally connected to said attachment member at a location adjacent said display area and having a distal head end adapted for insertion through an opening in an article to be indentified and forming an opening separate from said display area;
- d. locking means formed in said distal head of said arm;
- e. latching means formed in said display area of said body portion dimensioned and formed for interlocking with said locking means;
- f. a transparent, flexible, protective strip having a back face coated with an adhesive selectively encircling said body portion of said attachment member for covering said markings on said display surface; and
- g. said protective strip selectively covers said locking means and latch means for preventing said distal head end of said arm from separating from said display area of said attachment member.

4,492,049
ADVERTISING DISPLAY STRUCTURE AND SPORTS FACILITY
Marcia Gaylor, Suite 5706 300 N. State St., Chicago, Ill. 60610
Filed Oct. 24, 1983, Ser. No. 544,586
Int. Cl.³ G09F *15/00*
U.S. Cl. 40—624 **7 Claims**

1. The combination of an advertising display structure and a

sporting facility, the combination including a vertically-extending support member adapted to engage the ground at one end and to provide a support for both a basketball hoop and backboard and an advertising display, a basketball hoop and backboard affixed to said vertical support intermediate its ground-engaging end and its upper end, an advertising display



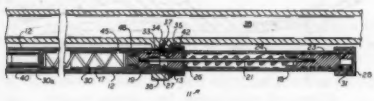
structure affixed to and supported by the upper end of said vertical support consisting of a frame and one or more message display panels carried by said frame, and illuminating means carried by said frame arranged so as to direct light downwardly from said advertising display structure and to illuminate the area below said display structure including said hoop and backboard.

4,492,050

SHOTGUN RECOIL REDUCER

Ken Kagehiro, Rte. 1, Colusa, Calif. 95932

Filed Apr. 12, 1983, Ser. No. 484,215
Int. Cl.³ F41C *21/18*
U.S. Cl. 42—1 V **13 Claims**



1. A recoil reducer for attachment to a shotgun having a barrel and a magazine tube below the barrel with a threaded forward end, comprising:

a cylinder tube comprising an extension for the forward end of the magazine tube, including a rearward-extending reinforcing sleeve of outside diameter sized to fit closely inside the shotgun's magazine tube, a forward extension connected to the sleeve, and threaded means on the exterior of the cylinder tube for engaging the threaded forward end of the magazine tube and securing the cylinder tube to the magazine tube such that the reinforcing sleeve extends into the magazine tube for stability of the cylinder tube and added strength for the magazine tube;

a slidable piston weight inside the cylinder tube, with means biasing it in the forward direction in the cylinder tube;

means forming an expansible chamber in the cylinder tube adjacent to the forward end of the piston weight;

gas conducting means for admitting pressurized gases generated upon the firing of a round in the shotgun, from the barrel to the expansible chamber to move the piston weight rearwardly against the biasing means;

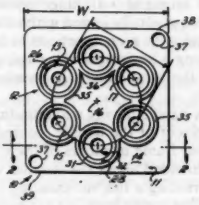
whereby, when a round is fired in the shotgun, pressurized gases from behind the fired shot are admitted from the barrel to the expansible chamber in the cylinder tube, pushing the piston weight rearward and thereby recoiling the shotgun forward to partially offset the recoil from firing of the round.

4,492,051

MODULAR CARTRIDGE LOADING BOARD SYSTEM

Robert D. Switzer, 149 Highview Dr., Ft. Thomas, Ky. 41075

Filed Sep. 19, 1983, Ser. No. 533,236
Int. Cl.³ F41C *27/00*; F42B *39/04*
U.S. Cl. 42—87 **15 Claims**



1. A modular cartridge loading board system comprising a plurality of modular cartridge storage blocks, each of those blocks having a series of cartridge tubes oriented on a generally circular locus of points and upstanding from one face of a base plate, said cartridge tubes being sized to receive a load of cartridges equal in number to the number of cartridge chambers in a hand gun's cylinder with which the cartridges are adapted for use,

a backing board on which said cartridge storage blocks are adapted to be connected, and

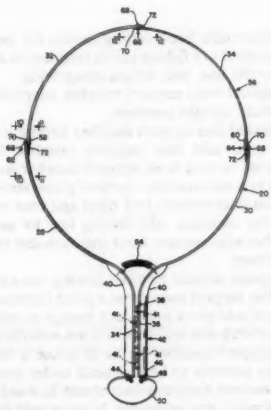
fasteners by which said cartridge storage blocks are connectable to said backing board, said plurality of cartridge storage blocks, fasteners and backing board being cooperable one with the other to provide a matrix of said cartridge storage blocks in connected fashion on said backing board as desired by the end user.

4,492,052

FOLDING FISHING NET

Bennie I. Davis, 6149 Belmore SW., Olympia, Wash. 98502

Filed Feb. 7, 1983, Ser. No. 464,679
Int. Cl.³ A01K *77/00*
U.S. Cl. 43—12 **5 Claims**



1. A folding fishing net, unfoldable by the motions of one hand of a stream fisherman creating a circular rim supporting a depending netting, via rotations about a longitudinal axis passing through the center of a handle and about a transverse

axis passing through the center of the opening created by the circular rim, comprising:

(a) a circular rim having four frame members, two of these frame members of opposite hand forming the one half of the circular rim nearest a handle and arranged for joining a handle, and equipped with hinge portions at a transverse axis, and two of these frame members of opposite hand forming the one half of the circular rim farthest from the handle, and arranged with hinge portions at a transverse axis and there pivotally joined with other frame members, and arranged with hinge portions to be pivotally joined together along a horizontal axis passing through the center of both the handle and the opening provided by the circular rim;

(b) a two piece handle having a longitudinal axis hinge, with respective pieces of the handle secured to the respective opposite hand frame members of the circular rim;

(c) a netting threaded about the circular rim and depending therefrom creating a fish surrounding net; and

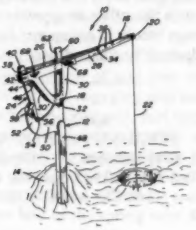
(d) a compression spring installed between the pieces of the handle where the opposite hand frame members first join the handle pieces, whereby the force of this compression spring aids in the rotation about the longitudinal axis of this fishing net from the folded position to the unfolded position.

4,492,053

AUTOMATIC HOOK SETTER

Gilles Poulin, 535 Richard, Rouyn-Noranda, Quebec, Canada J9X 4L9

Filed Jul. 13, 1983, Ser. No. 513,277
Int. Cl.³ A01K 97/12
U.S. Cl. 43—15 15 Claims



1. An automatic hook setting device for setting in a fish a hook connected to a fishing line in response to a pull exerted by the fish on the line, said device comprising:

an elongated main support member adapted to be held in a generally upright position;

an elongated line support member having a front end and a rear end, said line support member being pivotally mounted on said main support member for pivotal movement in a substantially vertical plane about a pivot point located intermediate said front and rear ends;

means for securing said fishing line to said line support member adjacent said front end such that said line depends therefrom;

an elongated tension member having one end connected to said line support member at a point intermediate said front end and said pivot point, said tension member being elastically stretchable in a direction towards the rear end of said line support member so as to cause a free end of said tension member to be displaced under tension in a direction towards the front end of said line support member;

a trip element for releasably holding said free end of said tension member whereby to releasably hold said tension member under tension, said trip element being pivotally connected to said line support member adjacent said rear end for pivotal movement between a loaded position whereat said trip element holds said tension member and an unloaded position whereat said trip element releases said tension member, said trip element when in the loaded position being normally urged to said unloaded position by said tension member;

trip retaining means on said main support member for releasably retaining said trip element in said loaded position, said trip retaining means adapted to release said trip element when said front end of said line support member pivotally moves downwardly a distance exceeding a predetermined displacement; and

stop means on said main support member adapted to engage said free end of said tension member for arresting same when released by said trip element and thereby causing said front end of said line support member to jerk upwardly;

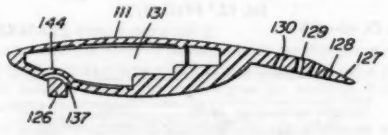
whereby a fish pulling on the fishing line to pivotally move the front end of said line support member downwardly a distance exceeding said predetermined displacement, causes said trip retaining means to release said trip element which is thus moved to said unloaded position and in turn releases said tension member so as to engage said stop means and cause said front end of said line support to jerk upwardly, thereby setting said hook in said fish.

4,492,054

FISH LURE

Gerald K. Barnhart, c/o 3252 Shelley St., Victoria, B.C., Canada V8P 4A5

Continuation-in-part of Ser. No. 319,906, Nov. 10, 1981,. This application Sep. 1, 1982, Ser. No. 413,881
Claims priority, application Canada, Jul. 30, 1981, 382884
Int. Cl.³ A01K 85/00
U.S. Cl. 43—42.23 10 Claims



1. A fish lure in the general shape of a tail-less minnow comprising a main body of generally hydrodynamic shape including a head portion and a tail tip portions: said main body having, in side elevational view, a gently rounded upper back surface and an arcuately rounded belly surface and having, in top plan view, side faces which diverge from the head portion to a maximum body thickness and then converge to the tail tip portion; a projecting, flat, plate-like nose extending from the head in the form of a smooth extension of the gently rounded upper back surface and extending downwardly less than the height of the body from the upper surface to the lower surface, the nose, in longitudinal section, having a bow portion constituted by an upper surface which near the body runs parallel to the bottom surface thereof, but which, near the tip slopes downwardly to merge with the lower surface at a forward edge thereof, the nose having a shape, in top plan view, of sides which diverge from the body portion, the diverging sides running forwardly in parallel with one another and then curving towards each other to meet in a flat front edge at the bow of the nose, only the nose further being provided with a plurality of spaced apart holes therethrough disposed along the central longitudinal axis thereof for securing a fish line drawn through a selected hole or holes; a depending tail fin along the central longitudinal axis of the body, said tail fin being associated with a fish-line guiding channel extending along an arcuate path longitudinally disposed above a joint between said tail fin and said body and extending longitudinally exclusively through said body; whereby, in use, an erratic a side-to-side

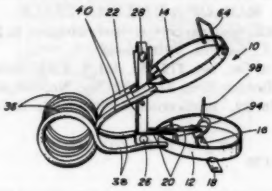
action is imparted to said fish lure simultaneously along with an oscillation of said lure along its longitudinal axis.

4,492,055

HUMANE ANIMAL TRAP

Michael Benz, deceased, late of Williams Lake, Canada by Violet E. Benz, Executrix, assignor to Violet E. Benz, Williams Lake; Michael J. Benz, Lavington and Randy Benz, Vernon, all of, Canada, a part interest to each

Filed May 17, 1983, Ser. No. 495,387
Int. Cl.³ A01M *23/26*
U.S. Cl. 43—88 **7 Claims**



1. A humane animal trap comprising:
(a) a pair of generally circular jaws, each jaw having arm means extending outwardly from the outer surface thereof;
(b) main spring means connected to said arm means so as to bias said jaws to a closed position, said jaws being openable against the bias of said spring means;
(c) lower trigger means pivotally connected to lug means outside one of said jaws and extending into the interior of said one jaw;
(d) support means extending generally perpendicularly from said lug means away from said one jaw;
(e) upper trigger means pivotally connected at one end adjacent the free end of said support means and engageable at the other end with a notch in said lower trigger means;
(f) catch means on said other jaw engageable with a second notch adjacent the one end of said upper trigger means; and
(g) latch means on said one jaw adjacent the free end of said lower trigger means and engageable therewith.

4,492,056

BODY GRIPPING ANIMAL TRAP STAND WITH TRIGGER

Russell R. Reasland, R.R. 2, Creston, Iowa 50801

Filed May 20, 1983, Ser. No. 496,446
Int. Cl.³ A01M *23/26*
U.S. Cl. 43—96 **9 Claims**

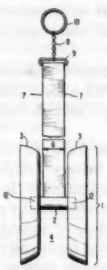
1. An improved release mechanism for a body grasping trap comprising first and second rectangular frames pivotally mounted to each other for pivotal movement about a horizontal axis from a set position to a sprung position, spring means yieldably biasing said frames from said set position to said sprung position, said rectangular frames each having a horizontal member, said horizontal members being in adjacent spaced relation to one another when said frames are in said set position, said horizontal members moving away from one another as said frames move from said set to said sprung position: said release mechanism comprising:
a first trigger frame member positioned between said horizontal members when said rectangular frame members are in said set position;
a pair of trigger arms mounted to said trigger frame for pivotal movement about a horizontal axis; each of said trigger arms having a shoulder facing said trigger frame and being movable from a catch position wherein said shoulders of said two trigger arms retentively embrace said horizontal frame members therebetween and hold said frame members in said set position to a release position wherein said shoulders move out of retentive engagement with said horizontal frame members and free said frame members for moving to said sprung positon;
said trigger frame comprising a horizontal rod extending parallel to said horizontal frame members, said trigger arms being pivotally mounted for pivotal movement around the longitudinal axis of said rod;
said horizontal rod including downwardly extending tines connected thereto for penetrating the ground and supporting said rod.

4,492,057

YO-YO WITH NON-CIRCULAR CROSS-SECTIONAL AXLE

Patrick MacCarthy, 37 Mines Park, Golden, Colo. 80401

Continuation-in-part of Ser. No. 298,720, Sep. 2, 1981, Pat. No. 4,442,625, which is a continuation-in-part of Ser. No. 138,729, Apr. 8, 1980, Pat. No. 4,290,224, and a continuation-in-part of Ser. No. 293,797, Aug. 18, 1981, Pat. No. 4,437,261. This application Aug. 30, 1982, Ser. No. 413,119
Int. Cl.³ A63H *27/12*
U.S. Cl. 446—250 **8 Claims**



1. A toy capable of combined rotational motion about an axle and translational motion in a vertical direction, comprising:
an assembled axle of non-circular transverse cross-section;
a first disc connected at its center point to one end of said axle;
a second disc connected at its center point to said axle at the end opposite that whereat said first disc is attached; and
a flexible torsional resistant tape one end of which is attached to said axle along the axle's longitudinal axis.

4,492,058

ULTRACOMPACT MINIATURE TOY VEHICLE WITH FOUR-WHEEL DRIVE AND UNUSUAL CLIMBING CAPABILITY

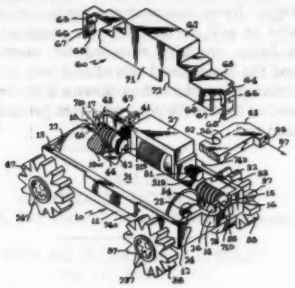
Adolph E. Goldfarb, 1432 SE. Wind Cir., Westlake Village, Calif. 91361, and Delmar K. Everitt, Woodland Hills, Calif., assignors to Adolph E. Goldfarb, Westlake Village, Calif.

Continuation of Ser. No. 233,495, Feb. 11, 1981, abandoned, which is a continuation-in-part of Ser. No. 121,645, Feb. 14, 1980, Pat. No. 4,306,375. This application Sep. 13, 1982, Ser. No. 417,554

The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.

Int. Cl.³ A63H *17/00*

U.S. Cl. 446—462 5 Claims



1. A miniature electrically self-powered wheeled toy vehicle for use with electrical battery means comprising an elongated dry-cell battery, and capable of climbing over operating surfaces that are rough and that include obstacles as well as climbing up operating surfaces that include steep inclines, said vehicle having major weight components positioned to provide a generally symmetrical, compact, balanced, and relatively low arrangement, while also providing adequate ground clearance in the area between the front and rear wheels, said vehicle comprising:

a frame having a right edge and a left edge;

front wheel means and rear wheel means mounted to the frame for rolling rotation about respective mutually parallel but spaced-apart front and rear axes, the distance between the front and rear axes being generally about two inches;

an electric motor mounted adjacent to one of said edges of the frame, and having a driveshaft which is perpendicular to the two axes and extends both fore and aft from the motor;

means mounted to the frame to releasably support such an elongated dry-cell battery alongside the motor and adjacent the other of said edges of the frame in a position with its longitudinal axis substantially parallel to the driveshaft, the length of such battery extending substantially the full distance between said front and rear axes; the motor and such battery side-by-side substantially occupying the full width between said right and left edges of the frame;

said motor being positioned between said axes and being substantially shorter than the distance between said axes to provide a pair of transmission spaces, one fore and one aft of the motor;

means for electrically connecting such battery, when supported in the supporting means, to the motor, so that such battery powers the motor; and

a pair of transmission means, each at least partially disposed in one of said transmission spaces and each comprising a speed reduction mechanism connecting one end of the driveshaft to one of the wheel means to transmit rotation from the driveshaft to such wheel means with reduced speed and with increased power;

at least a major portion of such battery, said motor and said transmission means being at approximately the same height as said front and rear wheel means; and

said frame, said motor, such battery and said transmission means not protruding any appreciable distance below the level of said front and rear axes in the area between said front and rear wheel means.

4,492,059

GRINDING DEVICE FOR THE REPROFILING OF A RAIL OF A RAILWAY TRACK

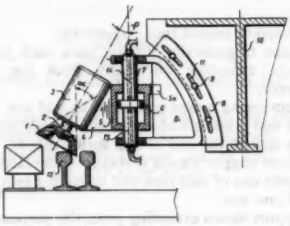
Romolo Panetti, Geneva, Switzerland, assignor to Speno International S.A., Geneva, Switzerland

Continuation of Ser. No. 279,554, Jul. 1, 1981, abandoned. This application Dec. 12, 1983, Ser. No. 560,262

Claims priority, application Switzerland, Jul. 23, 1980, 5331/80

Int. Cl.³ B21B *7/00, 23/00*

U.S. Cl. 51—178 10 Claims



1. In a grinding device for reprofiling a rail of a railroad track, comprising at least one grinding unit having at least one grinding wheel rotatably driven about an axis by a motor, means mounting said device on a grinding carriage of a vehicle adapted to move along the track, means to change the elevation of the grinding unit relative to the vehicle and to force the grinding unit against the rail, the grinding wheel having a front working surface; the improvement in which the grinding wheel has a conical peripheral surface having two side profiles on opposite sides of the grinding wheel intersecting above the rail on said axis of rotation of the grinding wheel, said two side profiles lying in the plane that is perpendicular to the length of the rail and in which plane said axis lies, and linear actuating means to feed the grinding wheel along a path approximately parallel to the said side profile that is closer to the rail surface that is being ground and toward the rail in said plane in which said axis lies, said path making an angle with the axis of rotation of the grinding wheel which is approximately equal to half the angle formed by said intersecting side profiles of the grinding wheel.

4,492,060

METHOD FOR OPTICALLY FINISHING CONNECTOR-MOUNTED OPTICAL FIBERS

Kenneth M. Clark, Irvine, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Division of Ser. No. 63,636, Aug. 3, 1979, abandoned. This application May 4, 1981, Ser. No. 260,660

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—283 R 3 Claims

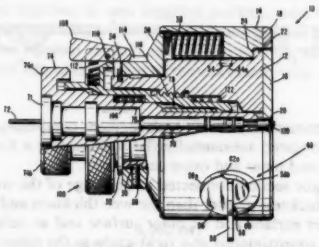
1. A method for providing end surface optical polishing of means defining at least one optical fiber housed in and extending from an end of a fiber optic ferrule, comprising the sequential steps of:

utilizing a tool in which the ferrule is retained;

providing a pair of relatively hard and soft surfaces on the tool;

positioning the fiber means and ferrule ends in the relatively soft surface;

positioning the relatively hard and soft surfaces coplanar, respectively, for grinding the extending fiber means flush



with the ferrule end by grinding implementation, and for limiting said grinding by a determinate amount; and

positioning the relatively soft surface forward of the relatively hard surface for polishing the fiber means to a desired optical quality by a polishing implementation different from the grinding implementation.

4,492,061

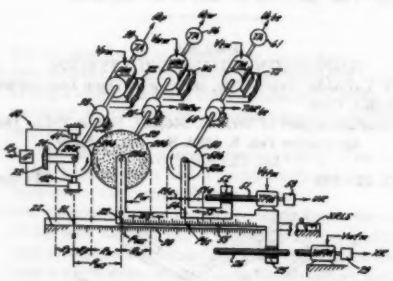
CONTROL SYSTEM FOR GRINDING APPARATUS

Roderick L. Smith, Rockford, Ill., assignor to Energy-Adaptive Grinding, Inc., Rockford, Ill.

Filed Mar. 5, 1982, Ser. No. 355,303

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—325 **27 Claims**



1. A method of grinding a selected workpiece with a selected grinding wheel at a desired grinding rate, said method comprising

determining the relationship between the wear rate of said grinding wheel and the feed rate at which said grinding wheel is fed into said workpiece, and

feeding said grinding wheel into said workpiece at a feed rate which is approximately equal to the sum of the desired grinding rate and the wheel wear rate corresponding to the feed rate.

4,492,062

WINDOW SILL

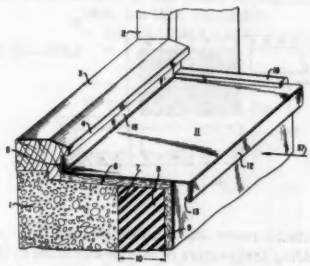
Pierre Levenez, Rochefoy, Villars, Loire, France

Filed Jun. 11, 1982, Ser. No. 387,589

Claims priority, application France, Jun. 11, 1981, 81 11887

Int. Cl.³ F04D *13/00*

U.S. Cl. 52—97 **12 Claims**



1. A window sill assembly for protecting and covering an exterior insulated wall adjacent an existing window sill at a base of a window, said window sill assembly comprising:

two elongated side members disposed opposite each other at said base of said window;

first fastening means for fastening said two elongated side members to said existing window sill in a spaced apart relationship such that said two elongated side members extend outwardly a predetermined distance from said base;

a rectangular plate mounted to said two elongated side members and disposed contiguous said existing window sill, said rectangular plate having one edge cooperating with one of said two elongated side members and an opposite edge cooperating with the other of said two elongated side members;

means for guiding said rectangular plate interposed said one edge of said rectangular plate and said one of said two elongated side members, said means for guiding further being interposed said opposite edge of said rectangular plate and said other of said two elongated side members to receive said one edge and said opposite edge of said rectangular plate for communication therewith, said rectangular plate further abutting said base of said window and being contiguous said existing window sill and said exterior insulated wall whereby any water collecting on said rectangular plate drains away from said base along said rectangular plate and is prevented from draining into said exterior insulated wall; and

second fastening means for fastening said rectangular plate to said existing window sill.

4,492,063

EXTRUDED PLASTICS MATERIAL HOLLOW PROFILED STRIP FOR WINDOW FRAMES, WINDOW FRAMES PRODUCED FROM THIS TYPE OF PROFILED STRIPS AND METHOD FOR THE PRODUCTION OF A WINDOW FRAME OF THIS TYPE

Karl Schock, Schorndorf, and Lothar Frank, Plüderhausen, both of Fed. Rep. of Germany, assignors to Schock & Co. GmbH, Fed. Rep. of Germany

Filed Mar. 31, 1982, Ser. No. 363,882

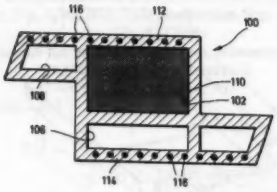
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1981, 3115254; Sep. 17, 1981, 3136863

Int. Cl.³ E06B *1/28*

U.S. Cl. 52—309.7 **13 Claims**

1. Extruded plastics material profiled strip for butt-welded window frames, said strip having a profile body with profile

walls forming a longitudinal chamber and consisting at least essentially of a thermoplastics material, at least one profile wall being provided with a reinforcement element which is integrally connected to said profile wall, characterized in that the reinforcement element consists of reinforcement fibres bonded to each other by a synthetic resin cement selected from the group comprising synthetic resins having thermoplastic properties and synthetic resins that manifest thermoelastic properties at the welding temperature of said profile walls so that the reinforcement fibres can be deflected during butt-welding and said reinforcement element being continuous and separate from said thermoplastic material forming said profile walls and said reinforcement element extending along said profile wall throughout its length.

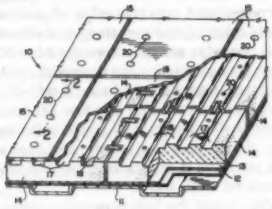


4,492,064

INSULATED ROOF CONSTRUCTION

Robert J. Bynoe, Chagrin Falls, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Dec. 11, 1981, Ser. No. 329,843
Int. Cl.³ E04B *5/00*
U.S. Cl. 52—309.8 **11 Claims**



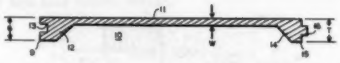
1. A thermal insulated roof construction comprising
a. a roof support means,
b. a water-impermeable layer overlying said roof support means,
c. a layer of thermal insulation overlying said water-impermeable layer and being unattached thereto throughout essentially its entire extent, said layer of thermal insulation being comprised of a plurality of panels position in side-by-side abutting relationship and having upper and bottom faces groves and ridges being formed in the upper faces facilitating water drainage from the ridges into the grooves, said panels being formed of a closed-cell cellular material and being essentially water-impermeable, and
d. a water-permeable protective layer overlying in contacting relationship said layer of thermal insulation to shield said layer of thermal insulation from sunlight.

4,492,065

SELF-ARCING TANK SEGMENTS

Herbert H. Clarke, Jr., 800 Garden St., Santa Barbara, Calif. 93101, and William E. Reefman, 2420 Calle Soria, Santa Barbara, Calif. 93109

Filed Jan. 15, 1979, Ser. No. 3,418
Int. Cl.³ E04B *2/08*; E04H *12/16*
U.S. Cl. 52—595 **3 Claims**



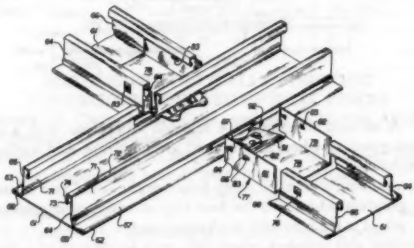
1. An automatically arcing tank segment comprising:
(a) an elongated substantially flat web having a thickness, edges, and inner and outer surfaces;
(b) a tongue section connected to one edge of the web having a thickness greater than the web thickness and having an inner surface and an outer surface and an outer edge that is approximately at a right angle to the outer surface of the web and forming a square inner corner with said inner surface and forming a square outer corner with said outer surface and having a tongue projecting from the outer edge intermediate the inner and outer surfaces;
(c) a groove section connected to the other edge of the web and having a thickness greater than the web thickness and having an inner surface and an outer surface and an outer edge that is approximately at a right angle to the outer surface of the web and forming a square inner corner with said inner surface and forming a square outer corner with said outer surface and having a groove projecting inwardly intermediate the outer surface and the inner surface;
(d) characterized by the web being located at one side of the tongue-and-groove section and the outer surfaces of the web, tongue, and groove sections forming a continuous smooth outer surface, and also characterized by said tongue having a cross section wherein the outer end of the tongue is not greater in thickness than the base of the tongue, and also characterized by the groove cross section being of a substantially uniform width over the distance of the tongue projection,
whereby the inner corner of the tongue section of one segment contacts the inner corner of the groove section of another segment to arc the cross sections of the segments.

4,492,066

SUSPENSION CEILING GRID SYSTEM

Paul D. LaLonde, Avon, Ohio, assignor to Donn Incorporated, Westlake, Ohio

Continuation-in-part of Ser. No. 346,857, Feb. 8, 1982,. This application Feb. 9, 1983, Ser. No. 465,249
Int. Cl.³ E04C *2/42*
U.S. Cl. 52—668 **28 Claims**



1. A suspension ceiling grid system comprising a plurality of elongated grid members providing a face portion and a pair of

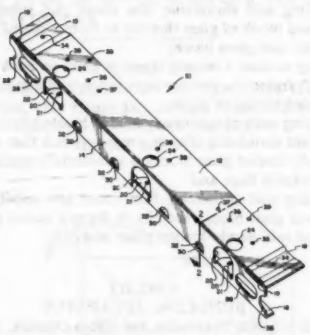
spaced webs extending therefrom, some of said members including logitudinally extending slots in said web at locations spaced from the ends thereof, some of said members also including end connectors providing upwardly extending resilient lock means, said end connectors being insertable through said slots, insertion of said end connectors through said slots deflecting said resilient lock means in a direction toward said face portion until an installed position is reached, said lock means being operable to engage the remote side of web to lock said members together in said installed position, said slots being formed substantially adjacent to said face portion so that tensile forces applied to said end connectors do not produce significant lateral deflection of the associated web.

4,492,067

END STILE APPARATUS AND METHOD FOR AN OVERHEAD DOOR SECTION

David O. Martin, Salt Lake City, and Lawrence G. Martin, Bountiful, both of Utah, assignors to Martin Door Manufacturing, Salt Lake City, Utah

Filed Sep. 29, 1982, Ser. No. 428,101
Int. Cl.³ E04C *2/38*
U.S. Cl. 52—822 **6 Claims**



1. An end stile for an overhead door comprising:

A back element, the back element being relatively wide and having a length generally corresponding to a width of the overhead door section and a hem-receiving indentation at each end;

a side element having a length corresponding to the length of the back element and a width corresponding to the thickness of the overhead door section;

a front element having a length corresponding to the length of the back element and a relatively narrow width, the back element, side element and front element are formed from a single piece of sheet metal formed into a modified J-shaped cross section; and

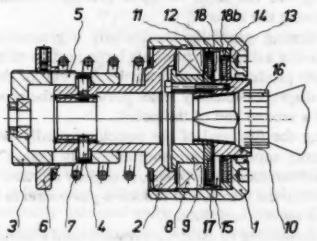
securement means for securing the end stile to an overhead door section panel comprising tab means formed in the end stile, said tab means comprising a spring clip means for clipping the panel to the front element, said tab means comprising a tab spaced from the front element, the tab serving as a securement element for the panel, said tab means comprising a first tab means and at least a second tab means, the first tab means spaced a first distance from the front element and the second tab means spaced a second distance from the front element.

4,492,068

CLOSURE APPARATUS WITH MAGNETIC COUPLING FOR SCREWING ON A PLASTICS SCREW CLOSURE

Albert Obrist, Kaiseraugst, Switzerland, assignor to Albert Obrist AG, Reinach, Switzerland

Continuation of Ser. No. 143,751, Apr. 25, 1980, Pat. No. 4,364,218. This application Aug. 16, 1982, Ser. No. 408,681
Claims priority, application Switzerland, Apr. 25, 1979, 3 885/79
The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.
Int. Cl.³ B65B *3/20*
U.S. Cl. 53—331.5 **10 Claims**



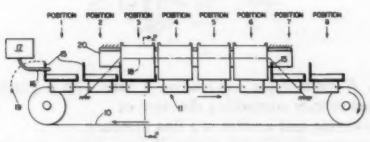
1. A closure apparatus for screwing a plastics screw closure onto a container provided with a screw-thread, said closure apparatus comprising a drive means and a screw-on head for screwing on the screw closure, a torque-limiting clutch arranged between the screw-on head and the drive means to interrupt the screwing-on process when a predetermined torque is reached, said clutch having a clutch member on the drive side and a clutch member on the driven side, said clutch members comprising clutch plates spaced from each other with plural permanent magnets positioned on facing surfaces thereof, the permanent magnets on each clutch member being arranged such that adjacent permanent magnets are of opposite polarity, and wherein in an idle position the permanent magnets defining aligned pairs of permanent magnets, each pair comprising one permanent magnet on each of the clutch plates, are of opposite polarity.

4,492,069

APPARATUS AND METHOD FOR FLATTENING A POUCH

Gordon Hewson, Cobourg, Canada, assignor to General Foods Inc., Ontario, Canada

Filed Feb. 28, 1983, Ser. No. 470,411
Int. Cl.³ B65B *1/24, 13/20*
U.S. Cl. 53—436 **12 Claims**



1. An apparatus for flattening a pouch of a flexible material containing therein a solid flowable product in a gaseous medium, comprising:

bucket means for mounting a pouch with a first pouch end containing a disproportionately large portion of the product located at a first end of the bucket means, and a second pouch end which contains a disproportionately lesser portion of the product, mounted at the opposite, second end of the bucket means,

tilting means operatively connected to said bucket means for

tilting the first end of the bucket means upwardly to place the pouch in an inclined position with the first pouch end raised,

and pressure means located above said bucket means for exerting a pressure against the sides of the pouch, while it is in its inclined position, to increase the pressure within the pouch, creating a gas space at the second end, and thereby permitting a sufficient volume of the solid flowable product to flow down toward the second end to generally even out the solid flowable product and hence generally flatten the pouch itself.

10. A method of flattening a pouch of a flexible material containing solid flowable product in a gaseous medium by evening out the solid flowable product within the pouch, comprising the steps of:

positioning generally horizontally a generally flat pouch having a disproportionately large portion of its solid flowable product located toward a first end of the pouch and a disproportionately lesser portion of the product located at a second end of the pouch,

tilting the first end of the pouch upwardly while concurrently applying a pressure uniformly against the opposed side surfaces of the pouch, to slightly increase the pressure within the pouch, and to form a gas pocket in the pouch at the second end thereof,

and continuing to exert the pressure until a sufficient portion of the solid flowable product at the first end runs down toward the second end to essentially even out the solid flowable product, and hence generally flatten the pouch itself.

4,492,070

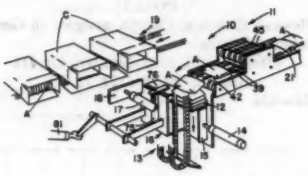
CASE LOADING APPARATUS AND METHOD

Hugh B. Morse, 1840 Campbell Ave., San Jose, Calif. 95125, and Helmut E. Masch, 764 Asbury St., San Jose, Calif. 95126

Continuation-in-part of Ser. No. 28,127, Apr. 9, 1979, abandoned. This application Mar. 27, 1980, Ser. No. 134,703

Int. Cl.³ B65B *35/50*

U.S. Cl. 53—438 **22 Claims**



16. A method for end-loading a case with a plurality of stacked articles comprising the steps of

conveying said articles in a first direction,

intermittently moving a plurality of platens in an endless path,

stacking a predetermined pluarlity of articles on a said platen while simultaneously lowering said platen,

stopping said platens while simultaneously pushing said articles off said platen and into a generally vertically disposed receptacle,

moving said receptacle generally horizontally to align said stacked articles with an open end of a case, and

pushing said articles from said receptacle and into the open end of said case.

4,492,071

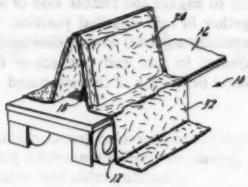
METHOD FOR PREPARING BLOCKS OF GLASS FOR SHIPMENT

Donald D. Gibson, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 23, 1983, Ser. No. 535,093

Int. Cl.³ B65B *11/02, 51/20, 53/06*

U.S. Cl. 53—442 **11 Claims**



1. A method for preparing a plurality of large blocks of glass for shipment on a transportable device, which method is characterized in the following steps:

providing an "A" frame carrier on the transportable device;

providing a plurality of layers of shrinkable film lying over and on both sides of said "A" frame carrier;

loading a block of glass on each side of said "A" frame carrier;

wrapping each block of glass in a layer of said shrinkable film in a manner such that each of said first glass blocks is substantially enclosed in said shrinkable film;

shrinking said shrinkable film about said substantially enclosed block of glass thereby to form a sealed pouch pack about said glass block;

loading at least a second block of glass on each side of said "A" frame carrier in association with said previously loaded blocks of glass;

wrapping each of said newly loaded blocks of glass in a layer of said shrinkable film in a manner such that each of said newly loaded glass blocks is substantially enclosed in said shrinkable film; and

shrinking said shrinkable film about said substantially enclosed glass blocks thereby to form a sealed pouch pack about said newly loaded glass blocks.

4,492,072

BUNDLING APPARATUS

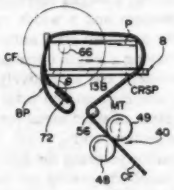
Toshiyuki Miyano, Yokohama, and Hideo Ohmura, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 31, 1983, Ser. No. 480,902

Claims priority, application Japan, Mar. 31, 1982, 57-52913

Int. Cl.³ B65B *11/00*

U.S. Cl. 53—586 **15 Claims**



1. A bundling apparatus comprising:

transfer means for receiving stacked objects to be bundled and transferring the same along a prescribed path of travel; and

bundling means for bundling the objects to be bundled transferred thereto by the transfer means,

said bundling means including winding means for winding a band around the objects to be bundled so that one end of the band is joined with another portion of the band, and bonding means for bonding together the joined end portions of the band wound around the objects to be bundled,

said transfer means including a carrier bearing thereon the objects to be bundled and capable of moving between a first position where the carrier receives thereon the objects to be bundled and a second position inside the winding means, and first driving means for moving the carrier from the first position to the second position after the objects to be bundled are set on the carrier, and then moving the carrier from the second position to the first position,

said winding means including

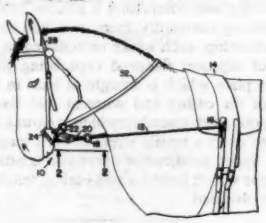
a catcher retaining the one end of the band and capable of moving across the path of travel, the catcher being moved along a line of movement including a third position below the objects to be bundled on the carrier and a fourth position above the objects to be bundled, the line of movement lies between the first and second positions, and second drive means for moving the catcher from the third position to the fourth position before the carrier moved from the first position toward the second position by the first driving means crosses the line of movement, moving the catcher from the fourth position to the third position after the carrier crosses the line of movement, thereby winding the band around the objects to be bundled, and then moving the catcher from the third position to a fifth position defined between the third and fourth positions, thereby joining the one end of the band with the other portion of the band.

4,492,073

BITTING RIG APPARATUS FOR TRAINING HORSES

Scott C. Finke, 7171 Eagan Dr., Savage, Minn. 55378

Filed May 6, 1983, Ser. No. 492,377
Int. Cl.³ B68B *1/00*
U.S. Cl. 54—35 4 Claims



1. A bitting rig apparatus for training horses, comprising:

(a) an elongated flexible member, said member being releasably attached at its ends to a saddle or the like on a horse on opposite sides of the horse, and extending about the outside of the horse's legs, said elongated member being configured such that when placed in tension, an intermediate portion of said elongated member is displaced forwardly of and apart from the horse's neck, the length of the elongated flexible member between its ends of attachment to the saddle being readily adjustable;

(b) a ring-like member slideably positioned on said elongated member for slideable movement therealong; and,

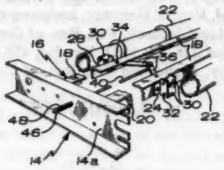
(c) a second elongated, resilient flexible member extending through said ring-like member, the ends of said second member being releasably attached to a shank portion at opposite ends of a bit positioned in the horse's mouth, said second elongated member being substantially shorter than said first elongated member, the second elongated resilient flexible member cooperating with the elongated flexible member when in tension to cause the horse's neck to flex an adjustable predetermined amount at its poll location.

4,492,074

PICKUP ROLLER SPREADER

Lloyd P. Sund, Newburg, N. Dak. 58762

Continuation-in-part of Ser. No. 516,472, Jul. 22, 1983,. This application Dec. 23, 1983, Ser. No. 564,892
Int. Cl.³ A01D *89/00*; B65G *15/50*
U.S. Cl. 56—364 6 Claims



1. In a pickup having at least one belt running over first and second belt rollers, said belt rollers begin parallel to one another and rotatably mounted and extending between first and second end frames, said pickup further comprising first and second cross members parallel to and located between said belt rollers and running between said first and second end frames, the improvement comprising:

at least two support rollers mounted on each said cross member intermediate said end frames in rolling relationship with a said belt roller; and

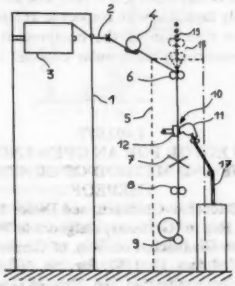
means for forcing said cross members apart and said support rollers into said belt rollers.

4,492,075

METHOD FOR PRODUCING FIBER SPUN YARNS AND THE FIBER SPUN YARNS OBTAINED WITH SAID METHOD

Jean-Louis Faure, Roanne, France, assignor to ASA S.A., Villeurbanne, France

Filed Jan. 17, 1983, Ser. No. 458,701
Claims priority, application France, Jan. 26, 1982, 82 01381
Int. Cl.³ D02G *3/34, 3/38*
U.S. Cl. 57—5 8 Claims



1. A method for producing a spun fiber yarn upstream of a false twist spindle, comprising:

(a) providing a textile core comprising a single yarn;

(b) guiding said core tangentially into a V-shaped channel having an open face and a bottom, said open face of said channel facing a parallelized elementary fibers projection zone;

(c) providing parallelized elementary fibers in said parallel-

ized elementary fibers projection zone, said parallelized elementary fibers being projected on and joined to said textile core; and

(d) subjecting said bottom of said channel to a flow of fluid to exert a pulling force on said parallelized elementary fibers.

4,492,076

PREPARATION DEVICE FOR MAKING A THREAD END READY FOR SPLICING

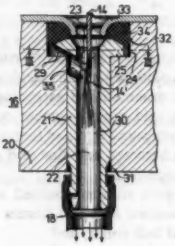
Ivica Romić, Osijek, Yugoslavia, and Jürgen Loos, Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Jan. 14, 1983, Ser. No. 458,160

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1982, 3201049

Int. Cl.³ D01H *15/00*

U.S. Cl. 57—22 **9 Claims**



1. Make-ready device for making a first thread end ready for connection to a second thread end in a thread joining device, the make-ready device having a hollow body open at opposite ends thereof for receiving the first thread therein and traversible by a gas flow, comprising at least one compressed gas guiding device for guiding the gas flow so as to at least partly stretch, parallelize and clean the fibers of the first thread in the hollow body, the compressed gas guiding device serving to control at least one of the nature and the direction of the compressed gas flow to the first thread end inside the hollow body, said compressed gas guiding device having a branch line connected to a compressed gas supply line and being continuously adjustably tappable with respect to at least the one of the nature and the direction of the compressed gas flow, said branch line comprising an annular channel surrounding the hollow body.

4,492,077

SPINNING ROTOR FOR AN OPEN-END SPINNING MACHINE AND METHOD OF CONSTRUCTION THEREOF

Hans Raasch, Monchen-Gladbach, and Dieter Busch, Wegberg, both of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

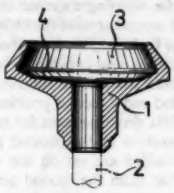
Filed Aug. 12, 1982, Ser. No. 407,612

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1981, 3132131; Nov. 7, 1981, 3144383

Int. Cl.³ D01H *1/12*

U.S. Cl. 57—414 **9 Claims**

1. Spinning rotor for an open-end spinning machine comprising a rotational body having a hollow interior, said body being formed of steel and having thereon a surface layer formed of at least one of the compounds iron carbide, iron boride, iron silicide and iron nitride at least at locations of said hollow interior thereof at which the spinning rotor comes into contact with spinning fibers spun into a thread, said steel body with said surface layer thereon having been heat-treated in a process wherein it had been hardened by being heated to a given temperature, then quenched in liquid, and thereafter tempered and having increased ductility at high elastic limits.



4,492,078

GAS TURBINE ENGINE CASING

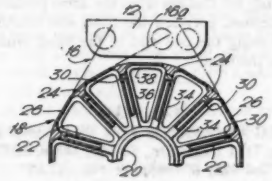
Willie Williamson, Derby, England, assignor to Rolls-Royce Limited, London, England

Filed Oct. 7, 1983, Ser. No. 540,186

Claims priority, application United Kingdom, Nov. 9, 1982, 8231922

Int. Cl.³ F02C *7/20*

U.S. Cl. 60—39.31 **5 Claims**



1. A polygonal casing suitable for use as a gas turbine engine bearing housing and comprising a hollow hub, a plurality of spokes radiating outwardly from said hub in equiangularly spaced relationship, each spoke terminating in a flanged cap, each pair of adjacent flangeed caps being joined via their flanges by a plate which is straight at least in a direction peripherally of the casing and wherein said flanged caps and plates comprise a sub assembly which is shrunk onto the spoke ends so as to exert a tensile stress of such magnitude on said plates that under predictable operating conditions of a gas turbine engine which includes said casing, tensile stress in said plates is not obviated.

4,492,079

METHOD AND APPARATUS FOR DETECTING DEGREE OF CLOGGING IN PARTICLE TRAPPING MEMBER OF INTERNAL COMBUSTION ENGINE

Shigeru Takagi, Anjo, and Nobutoshi Hayashi, Nishio, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 25, 1982, Ser. No. 361,613

Claims priority, application Japan, Mar. 30, 1981, 56-46755

Int. Cl.³ F01N *3/02*

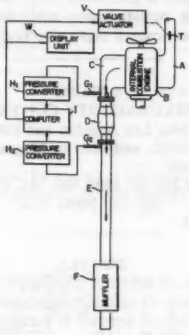
U.S. Cl. 60—274 **7 Claims**

1. A method for detecting the degree of clogging of a particle-trapping-member of an internal combustion engine and for trapping the particles contained in the exhaust gas discharge from an internal combustion engine by the particle-trapped-member disposed in the exhaust gas flow path, comprising:

the step of measuring a selected one of the difference ΔP1 of the pressure before and after said particle-trapped-member and the pressure P1 on the inlet side of said particle-trapping-member;

the step of measuring an exhaust gas flow rate signal pro-

duced from exhaust gas flow rate detector means, the step of comparing the selected one of the difference ΔP1 and the pressure P1 with the exhaust gas flow rate signal, thereby detecting the degree of clogging of said particle-trapping-member, wherein a muffler is disposed in the



exhaust gas flow path at the downstream side of said particle-trapping-member as said exhaust gas flow rate detector means, and the outlet of said muffler is open to the atmosphere, and the pressure on the inlet side of said muffler is used as said exhaust gas flow rate signal.

4,492,080

TRACTOR HYDRAULIC CONTROL SYSTEMS

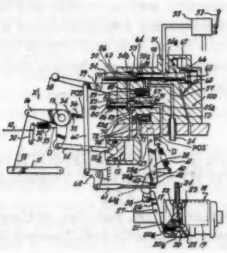
Robert E. Yapp, Solihull, and John D. Smith, Sutton Coldfield, both of England, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Continuation of Ser. No. 299,603, filed as PCT GB 80/00075, Apr. 30, 1980, published as WO 80/02355, Nov. 13, 1980, § 102(e) date, Jan. 9, 1981, abandoned. This application Feb. 21, 1984, Ser. No. 590,675

Claims priority, application United Kingdom, May 9, 1979, 7915993

Int. Cl.³ F15B *9/08*

U.S. Cl. 60—388 **7 Claims**



1. A tractor hydraulic control system comprising a power lift having:

a hydraulic actuator for raising and lowering an implement hitch;

a fluid pump;

conduit means connecting the actuator and pump;

a main control valve for controlling flow through the conduit means and having supply and discharge positions allowing the supply of fluid to and discharge of fluid from the actuator, and a neutral position in which fluid is neither supplied to nor discharged from the actuator; manually operable system control means for providing a power lift command signal to the main control valve; a system control mechanism operatively connecting the implement hitch, the main control valve and the system control means;

a selector valve connected in the conduit means, the selector valve having an external services outlet and a valve member movable between a first position in which flow to and from the actuator occurs via the selector valve under the control of the main control valve and the associated system control mechanism, and a second position in which the actuator is hydraulically locked in a given position and the external services outlet is placed in communication with the pump via the conduit means;

bias means to bias the main control valve towards a supply position in which the pump delivers its maximum output flow to the selector valve, and linkage means operatively connecting the selector valve and the system control mechanism to automatically disconnect the system control mechanism from the main control valve to allow the main control valve to move to said maximum pump output flow position under the action of the bias means on movement of the selector valve to its second position thereby ensuring the supply of fluid to the external services outlet.

4,492,081

LOW PRESSURE CASING FOR A BRAKE BOOSTER

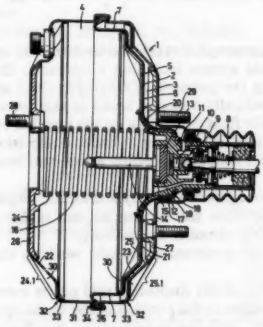
Rolf Weiler, Sindlingen; Peter Boehm, Frankfurt am Main; Lucas H. Haar, Niddatal, and Karlheinz Timtner, Bad Homburg, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 291,550, Aug. 10, 1981, abandoned. This application Mar. 21, 1984, Ser. No. 591,895

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1980, 3031206

Int. Cl.³ F01B *19/02*

U.S. Cl. 60—547.1 **4 Claims**



1. A low-pressure casing of thin-walled construction for a brake booster comprising:

an axially movable wall sealingly subdividing said casing into a low-pressure chamber and a working chamber;

two thin-walled casing shells sealingly interconnected to form said casing, one of said tow casing shells having a first end wall adjacent said low-pressure chamber disposed coaxial of and transverse to a longitudinal axis of said casing and the other of said two casing shells having a second end wall adjacent said working chamber disposed coaxial of and transverse to said axis, said first end wall having a first central reinforced ring flange disposed against an inner surface thereof coaxial of said axis, said first flange having at least one threaded mounting member integral to said flange for connection to a master cylinder, said second end wall having a second central ring flange disposed against an inner surface thereof coaxial of said axis, said second flange having threaded means integral thereto and extending through said second wall to con-

nect said booster to an automotive means, each of said first and second end walls including a first portion lying radially outside the associated one of said first and second flanges having a truncated cone configuration and a second portion merging into said first portion along a circumferential merging or transition area, said second portion being an outer cylindrical casing portion coaxial of said axis; and

a separate prop ring mounted and secured inside each of said two casing shells bearing against the inner surface thereof both said portions to bear against and reinforce both said first and second portions on both sides of the trantition area.

4,492,082

MASTER CYLINDER FOR HYDRAULICALLY ACTUATED BRAKES FOR AUTOMOTIVE VEHICLES

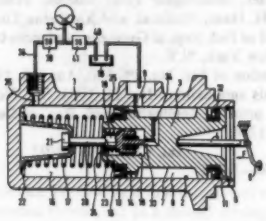
Juan Belart, Walldorf, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Mar. 4, 1983, Ser. No. 472,325

Claims priority, application Fed. Rep. of Germany, May 21, 1982, 3219134

Int. Cl.³ F15B 7/08

U.S. Cl. 60—589 10 Claims



1. A master cylinder for use in a vehicle hydraulic braking system, said system including a hydraulic fluid reservoir for controlling the pressure of hydraulic fluid acting on at least one hydraulically actuated brake in said system, said pressure of hydraulic fluid depending on the position of the brake operating member, said master cylinder comprising:

a cylinder member bounding an internal bore centered on an axis;

at least one piston sealingly and axially displaceably received in said bore and having an end surface that delimits a working chamber in said bore;

means for communicating said working chamber with the brake;

means for axially displacing said piston member in response to changes in the position of the brake operating member;

means for defining in said piston member a compensating passage that is in communication with the reservoir and has an axially extending portion which opens onto said end surface; and

means for establishing and interrupting communication between said compensating passage and said working chamber in dependence on the position of said piston member in said bore, including

a valve body slidably disposed in said working chamber,

a pin-shaped projection extending axially from said valve body toward said compensating passage and having a cross section configuration adapted to register only with said compensating passage, and

an annular elastic sealing element surrounding at least that portion of said pin-shaped projection which is closest to said valve body and operative for sealingly contacting said end surface of said piston member around said compensating passage portion upon predetermined displacement of said piston member toward said valve body while said pin-shaped projection is out of contact with said end surface, said pin-shaped projection and said sealing element bound with one another a gap of a predetermined internal dimension at least at the area thereof which is close to said end surface of said piston member, said internal dimension of said gap being larger than the internal dimension of said compensating passage whereby said sealing element is prevented from penetrating into said compensating passage upon said displacement of said piston member toward said valve body.

4,492,083

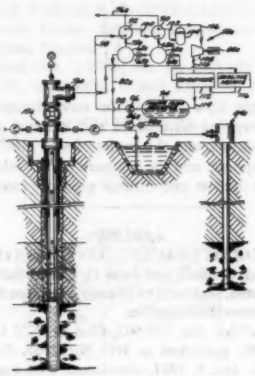
GEOTHERMAL SALINITY CONTROL SYSTEM

Barkman C. McCabe, Los Angeles, and Edward Zajac, Hollywood, both of Calif., assignors to Magma Power Company, Los Angeles, Calif.

Filed Jul. 18, 1980, Ser. No. 170,105

Int. Cl.³ F03G 7/04

U.S. Cl. 60—641.5 38 Claims



1. The method of reducing mineral scaling and corrosion in a geothermal energy system having a production well that provides access to an underground source of high temperature, highly saline geothermal brine and heat extraction means connected to said production well to receive said brine from said well, which comprises mixing non-geothermal water with said geothermal brine at a location in said system upstream of said heat extraction means, said non-geothermal water being much less saline than said geothermal brine.

4,492,084

METHOD FOR SUPPLYING REMOTE HEATING CIRCUITS WITH HEAT FROM A THERMAL POWER PLANT

Heinz Spliethoff, Friedrichsthal, Fed. Rep. of Germany, assignor to Saarbergwerke Aktiengesellschaft, Saarbrücken, Fed. Rep. of Germany

PCT No. PCT/EP81/00205, § 371 Date Aug. 20, 1982, § 102(e) Date Aug. 20, 1982, PCT Pub. No. WO82/02245, PCT Pub. Date Jul. 8, 1982

PCT Filed Dec. 23, 1981, Ser. No. 413,385

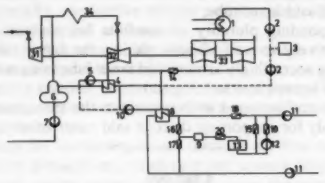
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048605; Sep. 19, 1981, 3137379

Int. Cl.³ F01K 17/00

U.S. Cl. 60—648 5 Claims

1. A method for supplying remote heating circuits with heat, which is taken at least partly from a thermal power plant, and utilizing at least one heat reservoir, located close to the power plant, at the beginning of a long distance heating flow and a return line to long distance heating circuits, preferably with water as a storage medium, comprising the steps of heating the storage medium to a constant base temperature by means of a

first circulation through a heat exchanger of a heat delivery unit, and raising the temperature of the storage medium to a value of greater than 110° C. immediately before it enters the



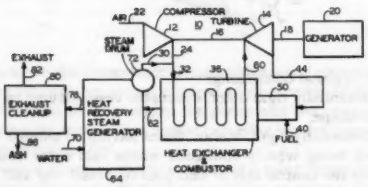
remote heating circuit by means of a second circulation of the storage medium through said heat exchanger of said heat delivery unit.

4,492,085

GAS TURBINE POWER PLANT

Charles R. Stahl, Scotia, and Archie H. Perugi, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 9, 1982, Ser. No. 406,124
Int. Cl.³ F01K *21/04, 23/10;* F02C *1/04*
U.S. Cl. 60—649 **26 Claims**



1. An improved gas turbine power plant using a state-of-the-art gas turbine comprising:

(A) a state-of-the-art gas turbine apparatus having at least one gas-driven turbine section and a compressor section driven by the turbine section for supplying a first pressurized gaseous stream;

(B) a combustor for burning a carbonaceous fuel or wood to form combusted gases to provide heat energy for driving the turbine section;

(C) at least a first heat exchanger means for transferring a portion of the heat energy provided by said combusted gases in said combustor to said pressurized gaseous stream; and

(D) at least, a first heat recovery steam generator which converts water to a first steam flow wherein said first steam flow is mixed with the pressurized gaseous stream from said compressor section to form a gaseous mixture and wherein said gaseous mixture is fed to said turbine section and is discharged therefrom as an exhaust gas stream.

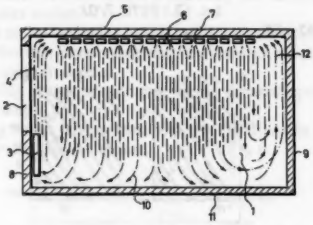
4,492,086

AIR CONDITIONING SYSTEM FOR HEATED ROOMS

Viktor Bollinger, Nordstrasse 29, D-5620 Velbert 1, Fed. Rep. of Germany

Filed Oct. 15, 1982, Ser. No. 434,498
Int. Cl.³ F25B *21/02*
U.S. Cl. 62—3 **4 Claims**

1. A passive Peltier effect room heat recirculating system including at least one longitudinal housing, said housing including an upper longitudinal reflection element, a spaced away lower longitudinal element, said upper longitudinal reflection element and said lower longitudinal radiating element spaced apart adapted to receive the flow of air through said housing, and a plurality of thermo-electric elements longitudinally aligned in said housing, said elements electrically interconnected and alternating an upper heat absorbing element and a lower heat radiation element, said heat absorbing element exposed to air flowing through said housing, said lower heat



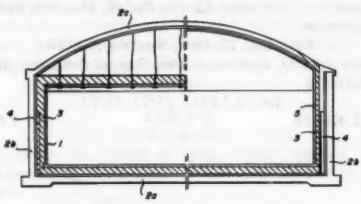
radiation element adapted to radiate heat through said lower longitudinal radiating element, whereby warm air in said housing is cooled and cool air in a room is warmed by heat radiated from said lower heat radiation element through said lower longitudinal radiating element.

4,492,087

CONTAINER FOR STORING REFRIGERATED LIQUIDS

Hans Schäfer, Darmstadt, and Michael Gaschler, Reinbeck, both of Fed. Rep. of Germany, assignors to Philipp Holzmann AG, Frankfurt and Gg. Noell GmbH, Würzburg, both of, Fed. Rep. of Germany

Filed Jun. 13, 1983, Ser. No. 503,693
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1982, 3222064
Int. Cl.³ F17C *1/00*
U.S. Cl. 62—45 **19 Claims**



1. Container for storage of refrigerated liquids comprising

a concrete outer container;

an insulation disposed on the bottom of the outer container,

an inner steel container resting on the insulation and disposed inside the outer container for providing an annular interspace between the inner wall side of the outer container and the outer wall side of the inner container;

insulating material filled into the interspace; and

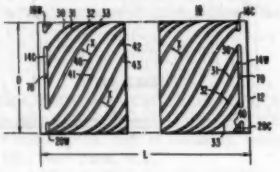
at least two gush braking bodies attached to either the outer wall side of the inner container and/or to the inner wall side of the outer container and protruding into the interspace, wherein the exposed angle between the tank and the gush breaking body is 90 degrees or greater, and wherein the gush braking bodies extend in radial direction to from about one quarter to one half of the width of the annular interspace between the two containers.

4,492,088

RADIATION SHIELD WITH HELICAL FLUID PASSAGES

El-Eraky A. Ibrahim, Monroeville, and Phillip W. Eckels, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 31, 1983, Ser. No. 499,627
Int. Cl.³ F17C 7/02
U.S. Cl. 62—55 13 Claims



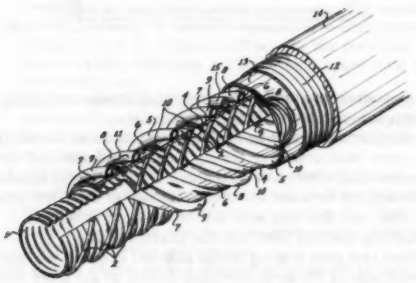
1. A superconducting generator, comprising:
a rotor assembly having a superconducting winding;
a radiation shield disposed cylindrically about said rotor assembly, said radiation shield having a first circumferential fluid passage at one of its axial ends and a second circumferential fluid passage at the other of its axial ends, said radiation shield having a helical fluid passage extending around the circumference of said radiation shield, said helical fluid passage providing fluid communication between said first and second circumferential fluid passages;
first means for introducing a fluid into said first circumferential fluid passage; and
first means for removing a fluid from said second circumferential fluid passage.

4,492,089

FLEXIBLE CRYOGENIC CONDUIT

Peter Rohner, Isernhagen; Klausdieter Schippl, Laatzen; Günther Blumenberg; Werner Meyer, both of Hanover, all of Fed. Rep. of Germany, and Wolfgang Obert, Oxford, England, assignors to Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 12, 1983, Ser. No. 531,054
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3234476
Int. Cl.³ F16L 11/11, 11/12
U.S. Cl. 62—55 5 Claims



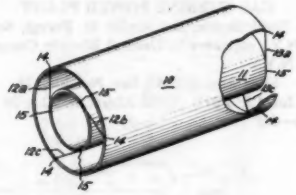
1. A cryogenic tube system including at first corrugated tube, the interior of which is to be thermally isolated against the exterior at large; and
a second, outer also corrugated tube concentrically arranged with respect to said inner tube, to establish a flexible assembly comprising:
a plurality of metallic ribbons being of a flat cross-section and arranged helically in an intertwined relationship around said inner tube;
a corresponding plurality of conduits for coolant affixed respectively to said ribbons, facing the outer tube and looping accordingly around said inner tube in a configuration of intertwined helices; and
spacer means arranged with respect to the aforementioned assembly for supporting thereon said outer tube.

4,492,090

CRYOSTAT FOR NMR MAGNET

Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 19, 1983, Ser. No. 533,336
Int. Cl.³ F17C 7/02
U.S. Cl. 62—55 16 Claims



1. A cryostat comprising:
a substantially rigid outer, evacuable vessel having an annular shape;
a substantially rigid interior vessel having an annular shape and being wholly contained within said outer vessel so that the central axis of said interior vessel and said outer vessel lie substantially along the same line;
a first set of at least three supporting ties extending transversely from attachment positions on a first end of said interior vessel to said corresponding attachment points on the proximal end of said outer vessel, said attachment points on said first end of said interior vessel being substantially uniformly disposed about the periphery thereof and said corresponding attachment points on said outer vessel being substantially uniformly disposed about said outer vessel; and
a second set of at least three supporting ties extending transversely from attachment points on a second end of said interior vessel to corresponding attachment points on the proximal end of said outer vessel, said attachment points on said second end of said interior vessel being substantially uniformly disposed about the periphery thereof and said corresponding attachment points on said outer vessel being substantially uniformly disposed about said outer vessel;
said first set of ties being disposed so as to inhibit relative rotation of said outer and said interior vessels in a first rotational direction and said second set of ties being disposed so as to inhibit relative rotation of said vessels in the opposite rotational direction.

4,492,091

APPARATUS AND METHOD FOR CONTROLLING A HEAT PUMP WATER HEATER

Robert J. Whitwell, Baldwinsville, and James P. Schafer, Cazenovia, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 20, 1983, Ser. No. 459,296
Int. Cl.³ F25D 17/00
U.S. Cl. 62—180 7 Claims

1. A water heating system including a tank wherein heated

water may be stored and a refrigeration circuit having a compressor, condenser and evaporator wherein the condenser includes a water passageway and a refrigerant passageway in heat exchange relation to transfer heat energy from the refrigerant to the water to be heated which comprises:

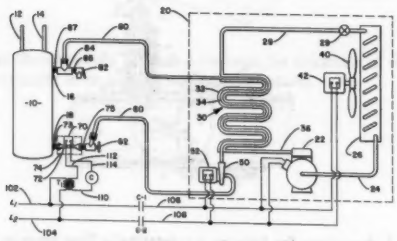
a thermally conductive tubular member extending from a bottom portion of the tank;

a first conduit connecting the tubular member to the water passageway of the condenser;

a second conduit connecting the water passageway of the condenser to the tank at a position spaced from the tubular member;

a pump for circulating water through the first conduit, the water passageway, condenser and second conduit;

thermal sensing means mounted to sense the temperature of the tubular member, said thermal sensing means being connected to energize the pump to circulate water, to



energize the compressor of the refrigeration circuit when the temperature sensed is below a first threshhold temperature and to de-energize the pump and the compressor when the temperature sensed exceeds a second threshhold temperature; and

insulation mounted about the thermal sensing means and the thermally conductive tubular member to reduce the heat transfer from the tubular member to the ambient air such that the temperature sensed by thermal sensing means is an accurate reflection of the temperature of the water in the tank, said insulation comprising an elastomeric foam sheet, said sheet being wrapped about said tubular member and said thermal sensing means, and further including a securing means for securing said sheet in position, and said sheet further defining an opening leading to said thermal sensing means for allowing said thermal sensing means to be adjusted without removal of said insulation.

4,492,092

COMBINATION REFRIGERANT CIRCUIT AND HOT WATER PREHEATER

Michael E. Smorol, Syracuse; Michael C. Wituszynski, Liverpool, and Theodore L. Woollis, Clay, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 2, 1982, Ser. No. 394,575
Int. Cl.³ F25D *17/00*
U.S. Cl. 62—181 **2 Claims**

1. A combination refrigeration circuit including a compressor and a hot water heating system which comprises:

a water inlet for receiving water to be heated;

a water outlet for discharging water to a storage tank and a hot water tap through a single conduit;

a pump connected to receive water from the water inlet and to circulate water through the water heating system to the water outlet, said pump being energized in conjunction with the compressor;

heat exchange means connected to receive hot gaseous refrigerant from the refrigeration circuit and to effect a transfer of heat energy from said refrigerant to the water flowing through the hot water heating system;

a first water conduit means connecting the heat exchange means to the pump;

valve means located downstream of said heat exchange means to control the flow of water from the heat exchange means to the water outlet;

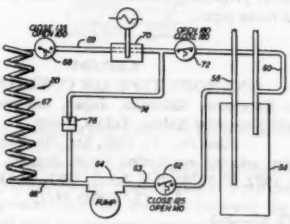
a second water conduit means connecting the heat exchange means to the valve means;

a third water conduit means connecting the valve means to the water outlet;

a bypass means including a flow restriction for limiting flow therethrough connecting the first conduit means to the third conduit means;

an entering water temperature sensor located upstream of said pump;

a leaving water temperature sensor located within said second water conduit means;



a safety temperature sensor located downstream of said bypass means within said third conduit means for sensing the temperature of the water flowing to the water outlet through the third conduit means including water flowing through the bypass means; and

circuit means connecting contacts of the safety temperature sensor, said entering water temperature sensor, and said leaving water temperature sensor in series with the valve means, and said contacts of said safety temperature sensor in series with said pump and compressor, which are in parallel, whereby said valve means is open only when said contacts of all three of said safety temperature sensor, said entering water temperature sensor, and said leaving water temperature sensor are closed by sensing the appropriate temperature conditions, and said compressor and said pump are running when only said contacts of said safety temperature sensor are closed.

4,492,093

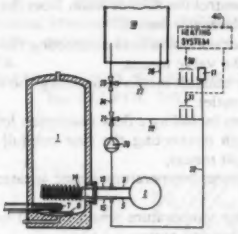
HEAT EXCHANGER SYSTEM

Alois Schwarz, St. Johann in Tirol, Austria, assignor to ID-Energiesysteme Gesellschaft m.b.H., St. Johann in Tirol, Austria

Filed Jul. 21, 1983, Ser. No. 516,135
Claims priority, application Austria, Jul. 21, 1982, 2825/82
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—238.6 **8 Claims**

1. A heat exchanger apparatus, comprising: a container containing a quantity of a liquid; a heat source arranged outside of said container; a pipe arrangement which is disposed within said container and includes an outer pipe and an inner pipe, said inner pipe being disposed within said outer pipe; first fluid circuit means for effecting fluid communication between said inner pipe and said heat source and for causing a first fluid to flow through said inner pipe and to carry heat from said heat source to said pipe arrangement and to discharge the heat through said pipe arrangement to said liquid in said container; pump means; second fluid circuit means for providing fluid communication between said pump means and said outer pipe, said pump means causing a second fluid to flow through said outer pipe in a direction opposite the direction in which said

first fluid flows through said inner pipe; inwardly projecting rib means provided on an inner surface of said inner pipe; and



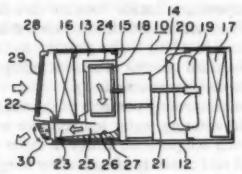
outwardly projecting rib means provided on an outer surface of said outer pipe.

4,492,094

ONE-BODY TYPE AIR CONDITIONER

Kaneo Katayama, Shizuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1983, Ser. No. 505,498
Claims priority, application Japan, Jun. 30, 1982, 57-113541; Jul. 8, 1982, 57-103523[U]; Jul. 8, 1982, 57-118932
Int. Cl.³ F25D *23/12*
U.S. Cl. 62—262 **6 Claims**



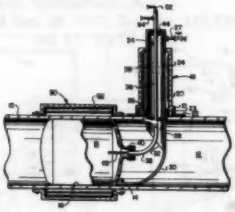
1. A single-body type air conditioner; comprising:
a casing;
a base plate placed in said casing;
a front panel connected to said casing and having an air intake grille formed therein at an upper portion thereof;
an intermediate partition positioned in said casing to define a room side section and an outdoor side section;
a room side heat exchanger positioned in said room side section;
an outdoor side heat exchanger positioned in said outdoor side section;
a room side fan and an outdoor side fan positioned respectively adjacent said room side heat exchanger and said outdoor side heat exchanger;
a driving motor having first and second shafts extending first and second sides thereof, first and second ends of said shaft securing said room side fan and said outdoor side fan respectively;
a drain pan and an air blowing outlet positioned below said room side heat exchanger;
room side air blowing passage means located within said casing to communicate said air intake grille with said air blowing outlet and which further comprises an air passage wall for forming a lower part of said room side air passage formed unitarily with said intermediate partition; heat insulator means interposed between said air passage wall and said base plate; and
a synthetic resin sound absorber and an air blowing louver located adjacent a lower portion of said front panel and which is placed downstream of said air intake opening and said air blowing outlet wherein said air blowing passage means and said air passage wall extend horizontally from said intermediate partition to said air blowing louver and wherein said air passage wall is of a gradually decreasing curved shape.

4,492,095

APPARATUS AND METHOD FOR FORMING A TEMPORARY PLUG IN A FLUID CONDUIT

Beryle D. Brister, Amarillo, Tex., assignor to Brister, Incorporated, Amarillo, Tex.

Division of Ser. No. 328,029, Dec. 8, 1981, Pat. No. 4,428,204.
This application Dec. 9, 1983, Ser. No. 559,787
Int. Cl.³ F25D *3/00*
U.S. Cl. 62—293 **14 Claims**



1. Apparatus for forming a substantially flow stopping plug in a conduit such as a fluid transmission line comprising:
a flexible bag formed of a substantially liquid impervious material;
conduit means connected at one end to said bag and adapted to be connected at the other end to a source of liquid for filling said bag with liquid when said bag is in a deployed position in the interior of said line; means extending into the interior of said bag for conducting fluid in heat exchange relationship with liquid in the interior of said bag; and
bag holding means for holding said bag in a collapsed condition, said bag holding means being operable to be connected to said line, said bag holding means including means for ejecting said bag from said bag holding means into said interior of said line whereby said bag may be filled with said liquid to be frozen to form said plug.

4,492,096

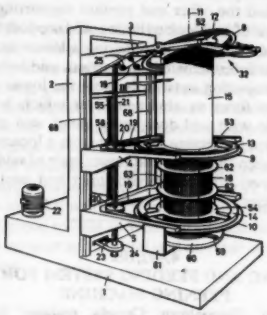
HOLLOW REINFORCEMENTS OF REVOLUTION MADE BY THREE-DIMENSIONAL WEAVING METHOD AND MACHINE FOR FABRICATING SUCH REINFORCEMENTS

Georges J. J. Cahuzac, Le Bouscat, France, assignor to Societe Nationale Industrielle Aerospatiale, France

Filed Jun. 27, 1983, Ser. No. 508,186
Claims priority, application France, Jul. 2, 1982, 82 11693
Int. Cl.³ D04B *9/12, 9/14, 9/16, 9/44*
U.S. Cl. 66—11 **20 Claims**

1. A reinforcement in the shape of a hollow cylindrical body of revolution about an axis, made by a three-dimensional weaving of three systems of threads comprising a first system of threads which are parallel to the axis of the reinforcement and disposed in an equidistant manner in coaxial sheets which sheets are also equidistant, said first system of threads defining therebetween two respective series of crossed passages, and a second system of threads and a third system of threads substantially contained in planes perpendicular to said axis, forming superimposed layers and inserted in said two respective series of crossed passages, the threads of said first system being dis-

posed in staggered relation to each other from one sheet to the neighbouring sheet and the two sheets of crossed passages



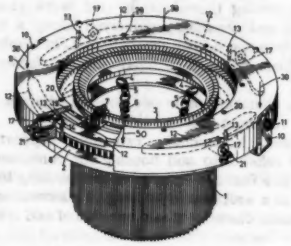
defined therebetween extending through the thickness of the reinforcement in an oblique non-radial direction.

4,492,097

CIRCULAR KNITTING MACHINE FOR HOSIERY ARTICLES

Carlo Ferraris, Cellatica, Italy, assignor to Santoni & Co. SpA, Italy

Filed May 17, 1982, Ser. No. 378,876
Claims priority, application Italy, May 19, 1981, 218178/81
Int. Cl.³ D04B 15/06
U.S. Cl. 66—108 R 5 Claims



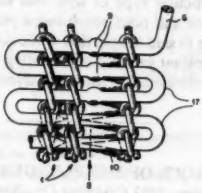
1. A circular hosiery knitting machine, more particular for ladies' stockings, having a needle cylinder, sinker-carrying rings secured to the top of said cylinder, and a lid overlying said rings, said lid housing outwardly of the sinkers in said rings, and in the intermediate areas between the individual points at which yarn is disposed to be fed, a plurality of sinker-pressing cams mounted to float dadially beneath said lid and to be centripetally shiftable by means adapted selectively to urge said cams toward heels on the sinkers, and characterized in that said urging means comprises a plurality of miniature pneumatic rams each with an attendant plunger, each of said sinker-pressing cams having, associated therewith, a ram and its attendent plunger, which is engagable with the last-named cam, said rams being con- nected in parallel together in a pneumatic circuitry comprising a control valve and a pressure regulator selectively for supplying air under pressure to said rams.

4,492,098

METHOD OF MAKING A SLIDE FASTENER COUPLING STRIP

Helmut Heimberger, Steinhausen, Switzerland, assignor to Optilon W. Erich Heilmann GmbH, Cham, Switzerland

Filed Jul. 10, 1981, Ser. No. 282,075
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1980, 3026448
Int. Cl.³ D04B 7/16
U.S. Cl. 66—202 1 Claim



1. A method of making a coupling strip for a slide fastener stringer comprising the steps of:

knitting a pair of relatively closely spaced warp chains and a further warp chain spaced from the pair of warp chains of a distance greater than the distance between the warp chains of said pair by sweeping respective thread guides for a warp filament for each chain back and forth with respect to a stitch-forming needle and inserting the synthetic resin monofilament thread into the stitches of said warp chain as they are formed to generate a fabric with said synthetic resin monofilament thread forming a weft inlay;

connecting the stitches of said warp chains by a weft-inserted thermally shrinkable yarn;

bending said fabric along a zone between said pair of warp chains and said further warp chain to form respective bends in said synthetic resin monofilament thread such that such bends from slide fastener coupling heads, while said further warp chain is disposed between the warp chains of said pair; and

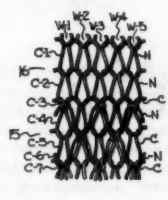
thereafter subjecting the bent fabric to heat to shrink said thermally shrinkable yarn and lock said further warp chain between the warp chains of said pair.

4,492,099

SHEER HOSIERY WITH A RUN-RESISTANT TOE AND METHOD

Sam C. Safrit, Pfafftown; Roscoe M. Farrell, Pittsboro, and Melvin C. Euliss, Burlington, all of N.C., assignors to Kayser-Roth Hosiery, Inc., Burlington, N.C.

Filed Aug. 15, 1983, Ser. No. 523,380
Int. Cl.³ D04B 7/16
U.S. Cl. 66—202 11 Claims



1. A circularly knit hosiery article having a sheer foot portion and a run-resistant toe portion, with said toe portion being adapted to have substantially the same dyed shade as the adjacent foot portion, said foot portion being knit of a fine denier

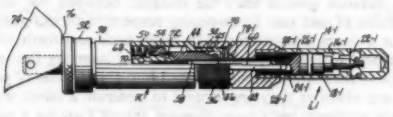
synthetic yarn capable of being dyed with a particular type of dye, said toe portion being integrally knit as a continuation of the sheer foot portion and comprising alternating single courses of plain stitch loops in every wale, and intervening single courses of alternating tuck and plain stitch loops in adjacent wales, at least some of said single courses throughout said toe portion being knit of a fine denier synthetic yarn capable of being dyed with said particular type of dye and the remaining courses of said toe portion being knit of a fine denier synthetic dye-resistant yarn which is not capable of being dyed with said particular type of dye, and said single courses of alternating tuck and plain stitch loops providing run-resistant characteristics to said toe portion while said single courses knit of said dye-resistant yarn aid in providing said run-resistant toe portion with substantially the same dyed shade as said sheer foot portion.

4,492,100

KEY FOR A LOCK OF THE PLUNGER OPERATED TYPE

James A. Swisher, 2497 Castellon Dr., North Jacksonville, Fla. 32217

Filed Jul. 9, 1981, Ser. No. 281,704
The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.
Int. Cl.³ E05B 19/18, 35/06
U.S. Cl. 70—34 6 Claims



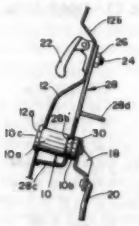
1. In a key for opening a lock of the plunger operated type, said key comprising a housing, a series of resilient fingers extending forwardly from a finger carrier axially movable in the housing, and a mandrel disposed between the fingers which is retractable through the finger carrier to spread the fingers, the improvement comprising adjustable means on the key for varying the effective length of the fingers.

4,492,101

LOCK CYLINDER ATTACHING DEVICE FOR VEHICLE MOVABLE CLOSURE LOCKS

Yoshiyuki Tanaka, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 14, 1982, Ser. No. 418,093
Claims priority, application Japan, Sep. 25, 1981, 56-151737
Int. Cl.³ E05B 9/08
U.S. Cl. 70—370 4 Claims



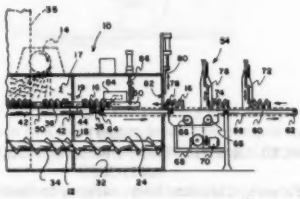
1. A lock cylinder attaching device comprising:
a vehicle body member;
a lock cylinder arranged transversely of said vehicle body member to have an outer end portion and an inner end portion;
means for attaching said outer end portion of said lock cylinder to said vehicle body member; and
a support having one end portion fixed to said vehicle body member and the other end portion supporting said inner end portion of said lock cylinder, said support being in the form of an elongated plate having a lower end bent portion and an intermediate bent portion, said lower end bent portion projecting outwardly from the lower end of said support to form an abutment arm which is abuttingly engageable with said door outer panel, said intermediate bent portion projecting inwardly from a location intermediate between the upper and lower ends of said support to form a cover concealing said inner end portion of said lock cylinder.

4,492,102

SEPARATING AND FEEDING SYSTEM FOR A SHOT PEENING MACHINE

Gerold Lienert, Georgetown, Canada, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 30, 1982, Ser. No. 445,393
Int. Cl.³ B21J 5/00
U.S. Cl. 72—53 5 Claims



1. A separating and feeding system for a shot peening machine of the type which includes blast wheel means or the like which is mounted on a housing thereof and is capable of propelling a plurality of shot generally downwardly into a critical blast region within said housing for shot peening a plurality of work pieces passing therethrough, said work pieces being supported on and separately conveyed along a horizontal peening path into one side of, through, and out another side of said critical blast region, said separating and feeding system comprising:
an entrance chamber within said housing adjacent said critical blast region at said one side thereof;
an elongated, horizontally extending support surface mounted relative to said housing for continuous movement from a first end exterior of said housing through an opening in a wall of said housing to a second end within said entrance chamber at said one side of said critical blast region;
said horizontally extending support surface being capable of supporting said work pieces thereon and making sufficient frictional contact therewith for transportation of said work pieces from said first end to said second end thereof, said horizontally extending support surface being able to continue said movement beneath any of said work pieces which are prevented by retarding means from continuing said transportation;
said retarding means including a shot screening and work piece stopping gate in a normally closed position at said opening to prevent escape of said shot therethrough and entrance of one of said work pieces into said entrance chamber;
means for indicating when said one side of said critical blast region is available for delivery of said one work pieces thereto;
said means for indicating producing a signal for opening said shot screening and work pieces stopping gate for a predetermined amount of time to allow said movement of said horizontally extending support surface to cause said trans-

portation of said one work piece into said entrance chamber, to said second end of said horinzontally extending support surface and to said one side of said critical blast region; and

a secondary shot screening gate between said shot screening and work piece stopping gate and said second end of said horizontally extending support surface, said secondary shot screening gate being in a normally opened position, receiving said signal from said means for indicating to be closed thereby for said predetermined amount of time when said shot screening and work piece stopping gate is opened and returning to said normally opened position prior to said transportation of said one work piece therethough to insure it will not retard as transportation of said one work piece to said second end of said horinzontally extending support surface and said one side of said critical blast region.

4,492,103

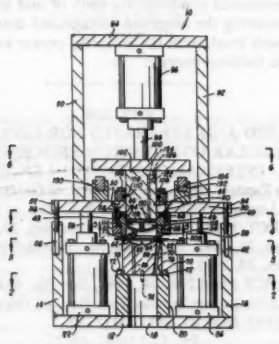
APPARATUS FOR MANUFACTURING RUPTURE DISKS

Leo J. Naumann, Broken Arrow, Okla., assignor to BS&B Safety Systems, Inc., Tulsa, Okla.

Division of Ser. No. 465,799, Feb. 11, 1983, Pat. No. 4,458,516. This application Apr. 20, 1984, Ser. No. 602,541

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—55 **10 Claims**



1. Apparatus for manufacturing scored or perforated rupture disks from sheet metal sections comprising:

a base;

a rupture disk forming die removably attached to said base;

means for sealingly clamping a sheet metal section to said die and cutting said section into a disk movably positioned adjacent said die;

means for applying pressurized fluid to a sheet metal disk whereby said disk is forced against and conformed to said die attached to said clamping and cutting means;

means for selectively moving said clamping and cutting means into and out of clamping and cutting contact with a sheet metal section attached to said base and to said clamping and cutting means;

a movable ram having a score or perforation forming blade attached thereto sealingly attached to said clamping and cutting means and positioned to move said blade into forceable contact with a sheet metal disk forced against and conformed to said die whereby scores or perforations are formed on or in said disk; and

means for selectively moving said ram attached thereto and to said clamping and cutting means.

4,492,104

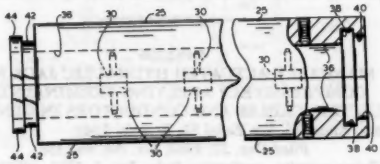
EXPLOSIVE SHAPING OF METAL TUBING

Henry Weaver, and Joseph C. Pawlush, both of York, Pa., assignors to Meadowcraft Inc., Birmingham, Ala.

Filed Dec. 2, 1981, Ser. No. 326,451

Int. Cl.³ B21D *26/02*

U.S. Cl. 72—56 **1 Claim**



1. A method for explosively shaping a deformable metal tube blank comprising the steps of:

providing a forming die having a bore therein, the surfaces defining said bore being a negative of the configuration desired on the exterior surface of the metal tubing to be shaped;

providing a breech assembly at one end of said bore, said breech assembly including means for receiving a shell, detonating means for exploding said shell, and means for connecting said breech assembly with said bore such that the exploding of said shell causes an explosive force to be exerted within said bore; filling said metal tube blank with a liquid medium;

exploding said shell thereby causing said liquid medium to transmit the explosive charge to the inner wall of the tube and cause the tube blank to assume the desired configuration; and

removing the liquid medium from said tube by causing a blast of gas from said breach assembly to be introduced into said tube.

4,492,105

TIGHTENING DEVICE FOR THE GRIPPING JAWS OF A PLATE STRETCHER

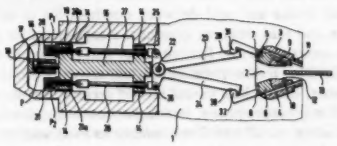
Heinrich Kutz, Neuss; Gunter Ostlinning, Dusseldorf, and Gerd Jung, Koblenz, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 15, 1982, Ser. No. 358,242

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3111140

Int. Cl.³ B21D *11/02*

U.S. Cl. 72—302 **11 Claims**



10. In a plate stretcher comprising a gripping head having a griping mouth, at least one pair of plate-gripping jaws in the gripping mouth, V-form guide means in which the jaws are slidable, and means for sliding the jaws relative to the guide means synchronously forwards for closing the jaws and backwards for opening the jaws, the improvement wherein said means for sliding said jaws comprises, driving means and, for each jaw of said pair of jaws, a respective coupling member operatively positioned to be in compression between said driving means and the associated jaw during forward movement for moving said jaw forwards to close the jaws, said coupling member being releasably operatively associated with said jaw

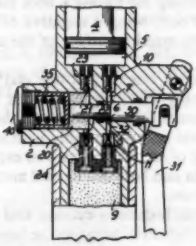
so that said coupling member is separable from said jaw during operation of the plate stretcher, and means for moving each coupling member between a first position wherein said coupling member is in operating relationship with a respective jaw and a second position wherein said coupling member is in nonoperating relationship with a respective jaw and clear of the region of movement of said jaw so that said jaw is movable separately and independently of said coupling member.

4,492,106

MANUALLY ACTUATED HYDRAULIC JACK FOR COMPRESSIVELY APPLYING TERMINALS ON ELECTRIC CABLES AND CONDUCTORS IN GENERAL

Mario Amighini, Via Zadei 52, Brescia, Italy

Filed Dec. 27, 1982, Ser. No. 453,188
Claims priority, application Italy, Jan. 7, 1982, 19015 A/82
Int. Cl.³ B21J 9/18
U.S. Cl. 72—453.02 4 Claims



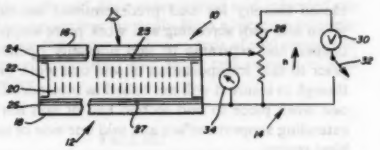
1. A manually actuated hydraulic jack for compressively applying terminals on electric cables and conductors in general, comprising a jack body, a fixed jaw rigidly associated with said jack body, a moving jaw facing said fixed jaw, an actuating lever handle pivoted to said jack body for effecting a forward stroke toward said jack body and a reverse return stroke, a cylindrical chamber in said body, a piston movable within said cylindrical chamber and rigidly connected to said movable jaw, a working fluid reservoir, first and second chambers in said jack body, a first intake conduit and a first delivery conduit for establishing communication between said reservoir and said first chamber and between said first chamber and said cylindrical chamber, second intake conduit and second delivery conduit for establishing communication between said reservoir and said second chamber and between said second chamber and said cylindrical chamber, one-way valving means in said intake and said delivery conduits for controlling said intake and said delivery conduits, a high-pressure piston sealingly movable in said first chamber and pivoted to said actuating handle, a low-pressure piston movable in said second chamber, elastic bias means in said second chamber acting on said low-pressure piston, said high-pressure piston having a lug protruding out of said first chamber toward said second chamber and acting on said low-pressure piston, for urging it, during the forward stroke of the actuating lever handle, to a retracted filling position where said elastic means is compressed wherein said second chamber is filled in use with working fluid through said second intake conduit and said first chamber has discharged working fluid contained therein through said first delivery conduit, said elastic means acting on said low-pressure piston during the reverse stroke of said actuating lever handle for bringing said low-pressure piston in its expanded position to discharge the working fluid filling said second chamber through said second delivery conduit and urge said high-pressure piston in its retracted position where said first chamber is filled with working fluid through said first intake conduit.

4,492,107

ACOUSTIC POWER METER

Jaswinder S. Sandhu, Chicago, Ill., assignor to RAJ Technology Partnership, Chicago, Ill.

Filed Mar. 22, 1982, Ser. No. 360,623
Int. Cl.³ G01H 9/00
U.S. Cl. 73—1 DV 15 Claims



1. A method of calibrating an acoustic power meter which includes a liquid crystal detector cell and circuit means for controllably applying a DC electric field to said cell, said method comprising the steps of:

(a) determining the electrical resistance of the detector cell;

(b) providing different levels of acoustic energy;

(c) exposing said cell to a plurality of said different levels of acoustic energy and determining the voltage required to restore the cell to the unexcited condition for each of said levels;

(d) determining from the resistance of the cell and voltage applied thereto the power required to restore the cell to the unexcited condition for each of said levels; and

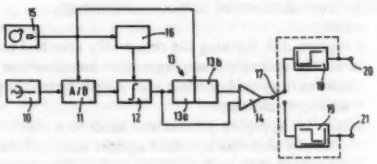
(e) correlating the observed voltage and determined power for each level, with the restoring power being equivalent to the incident energy.

4,492,108

METHOD AND APPARATUS FOR RECOGNIZING IRREGULAR COMBUSTION PROCESSES IN AN INTERNAL COMBUSTION ENGINE

Anton van Zanten, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE82/00034, § 371 Date Sep. 29, 1982, § 102(e) Date Sep. 29, 1982, PCT Pub. No. WO82/03685, PCT Pub. Date Oct. 28, 1982
PCT Filed Feb. 24, 1982, Ser. No. 432,913
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1981, 3115194; May 27, 1981, 3121120
Int. Cl.³ G01L 23/22
U.S. Cl. 73—35 12 Claims



1. A method for recognizing the knocking of an internal combustion engine,

in which a sensor signal is integrated within an interval of the combustion cycle to produce an intelligence signal,

at least one intelligence signal associated with the knocking process is compared with at least one reference signal corresponding to the background noise and

a recognition signal is emitted whenever the intelligence signal exceeds the reference signal in a prespecified manner,

wherein, in accordance with the invention,

the intelligence signal occurring during one combustion cycle is stored and,

during the next combustion cycle, this stored intelligence signal is used as a reference signal and is compared with the intelligence signal appearing at that time,

and wherein,

in the event of the emission of the recognition signal for knocking combustion during a combustion cycle,

the reference signal used during this combustion cycle is also used during the following combustion cycle.

4,492,109

KNOCKING DETECTION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

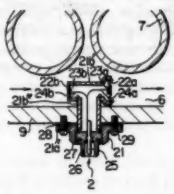
Tadashi Ozaki, Gamagori; Tadashi Hattori; Kazuhiko Miura, both of Okazaki; Masanori Hanaoka, and Yukihide Hashiguchi, both of Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Oct. 13, 1982, Ser. No. 433,878

Claims priority, application Japan, Oct. 14, 1981, 56-164842; Oct. 14, 1981, 56-153423[U]

Int. Cl.*³ G01L *23/22

U.S. Cl. 73—35 **4 Claims**



1. An apparatus for detecting knocking occurring in at least one of aligned cylinders in a cylinder block of an internal combustion engine, comprising:

sensing means, mounted on a mounting portion of a wall of said cylinder block, for sensing pressure pulsations propagating through cooling water which flows around said cylinders in said cylinder block,

said sensing means including first and second diaphragm means, each comprising a diaphragm, one surface of which is exposed to said cooling water in a space defined by said wall of said cylinder block and said cylinders, and a transducer, secured to the other surface of each of said diaphragms, for outputting signals corresponding to pressure changes caused by said pulsations, said one surface of the diaphragm of said first means being located downstream from said mounting wall portion with respect to the flow of cooling water, and said one surface of the diaphragm of said second means being located upstream from said mounting wall portion with respect to the flow of cooling water, wherein

said first diaphragm means has a higher sensitivity to pressure changes than does said second diaphragm means.

4,492,110

ULTRA SENSITIVE NOBLE GAS LEAK DETECTOR

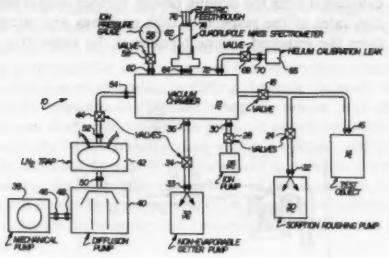
Lyle E. Bergquist, Lakewood, Colo., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Jun. 1, 1983, Ser. No. 499,825

Int. Cl.*³ G01M *3/00*; B01D *59/44

U.S. Cl. 73—40.7 **5 Claims**

1. In a noble gas leak detector having a vacuum chamber, a gas detector and a getter pump connected through connection means to said vacuum chamber and connection means for placing a test object in gaseous communication with said vacuum chamber, the improvement wherein said getter pump is a non-evaporable getter pump which entraps non-noble gases but not noble gases, each of said connection means consists of metal-to-metal contact surfaces, and said vacuum chamber and



equipment connected thereto form an internal vacuum passage consisting of metal.

4,492,111

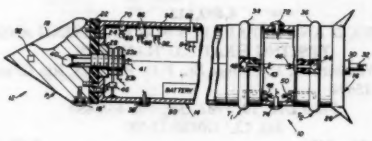
RHEOLOGICAL PENETROMETER

James L. Kirkland, 2211 Lombardy Ave., Panama City, Fla. 32405

Filed Oct. 7, 1981, Ser. No. 309,403

Int. Cl.*³ G01N *3/00

U.S. Cl. 73—84 **13 Claims**



1. A probe for determining characteristics of a medium comprising an outer housing for supporting a penetration assembly, a monitoring assembly, a guide assembly and control means for controlling the impact velocity and direction, said penetration assembly including soil penetration means for allowing the probe to penetrate the soil, said monitoring assembly including a plurality of vibrating bodies positioned so as to project at least in part away from said housing so that each is vibrated a predetermined amount in response to the passage of specific mediums there past, first sensor means for sensing the vibration of each of said vibrating bodies and for generating a signal corresponding thereto, and electrode means for sensing the electrical resistance of the medium orthogonally in three separate directions.

4,492,112

OPTIMUM SHIFT POSITION INDICATING DEVICE OF VEHICLE

Kouhei Igarashi, Susono, and Kazuo Tomita, Gotenba, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 30, 1982, Ser. No. 403,814

Claims priority, application Japan, Apr. 13, 1982, 57-61247

Int. Cl.*³ G01M *15/00

U.S. Cl. 73—117.3 **11 Claims**

1. The optimum shift position indicating device of a vehicle, comprising:

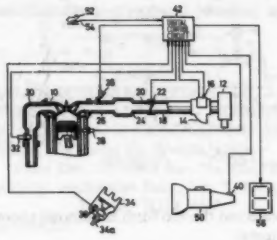
a vehicle speed sensor for detecting a running speed of the vehicle;

an engine rotation sensor for detecting a rotational speed of an engine;

an engine load sensor for detecting an engine load;

an operational circuit in which a driving power at present is

calculated from an engine torque obtainable from the engine rotational speed and the engine load, subsequently, required engine torques at respective shift positions are calculated form the driving power, further, fuel consumption rates at the respective shift positions are calculated from the required engine torques at the respective shift



positions and the engine rotational speeds obtainable from said detected vehicle running speed, and information on the optimum shift position where the best fuel consumption rate is obtainable is outputted; and

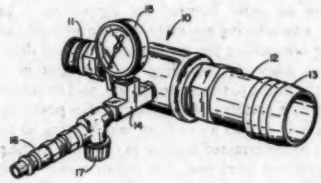
shift position indicating means for indicating an output from said operational circuit.

4,492,113

METHOD AND APPARATUS FOR CLEANING AND TESTING HEAT EXCHANGERS

Philip Westerholt, E. College St., P.O. Box 265, Rio Grande, Ohio 45674

Filed Dec. 10, 1982, Ser. No. 448,459
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—118 **8 Claims**



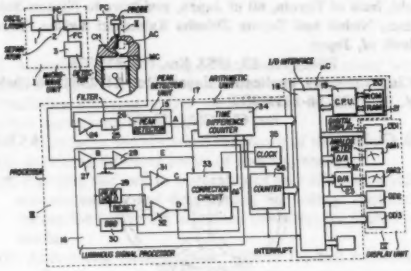
1. A combination cleaning and static testing device for a heat exchanger, said cleaning and testing device being generally in the shape of a "T", the top portion of said T-shaped portion of said device being hollow and tubular in shape and being provided with water source connecting means at one end for connecting said device to an external source of water and the other end of said T-shaped portion of said device being provided with heat exchanger connecting means for connecting said device to a heat exchanger, a hollow tubular portion constituting the single leg of the T-shaped portion being connected to the hollow tubular top portion of said T-shaped portion and being provided at its open end with air source connecting means capable of connecting said device to a source of air under pressure, said single leg of said T-shaped portion connecting means containing a shut-off and variable pressure air control valve for modulating and closing off the flow of air into said testing device and also containing between said air flow modulating and closure means and the hollow tubular top portion of said T-shaped portion, means for measuring the pressure in said device.

4,492,114

APPARATUS FOR DETECTING COMBUSTION TIMING

Teruo Yamanaka, 1756-2, Aza Hosoguchi-shita, Oaza Hirabari, Tempaku-cho, Tempaku-ku, Nagoya-shi, Aichi-ken; Kizo Hayakawa, 41-2, Higashiyashiki, Takayokosuka-cho, Tokai-shi, Aichi-ken; Yasuhiko Suzuki, 8, Yamane-cho, Tempaku-ku, Nagoya-shi, Aichi-ken, and Michiru Ezaki, 2, Uezono-cho 2-chome, Meito-ku, Nagoya-shi, Aichi-ken, all of Japan

Filed May 20, 1983, Ser. No. 496,656
Claims priority, application Japan, May 25, 1982, 57-88290
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—117.3 **16 Claims**



1. An apparatus for detecting combustion timing in an internal combustion engine comprising:

a microwave unit comprising a microwave oscillator for generating a microwave having a predetermined frequency, a transmission and reception separator connected to said microwave oscillator, for separating transmitted and received microwaves from each other, and a detector connected to said transmission and reception separator, for detecting the received microwave so as to be converted to a low frequency signal;

a probe means comprising a microwave sensor connected to said separator, for radiating the microwave from said separator into a combustion chamber of said internal combustion engine and receiving a reflected wave, and a light sensor for electrically detecting light emitted upon combustion in the combustion chamber; and

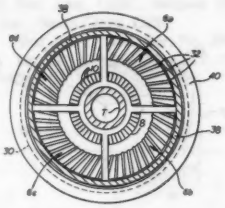
a processing unit comprising a peak detector circuit, connected to said detector of said microwave unit, for detecting peaks of a microwave signal supplied by said detector, a luminous signal processor, connected to said light sensor of said probe means, for detecting a peak value of a luminous signal supplied by said light sensor in each cycle and also detecting the time when the luminous signal reaches an intensity having a predetermined proportion to the peak value thereof, and an operating unit, connected to said peak detector and luminous signal processor, for operating a time difference between a middle point between a pair of peaks of the microwave signal and the time when the luminous signal reaches an intensity having a predetermined portion to the peak value thereof based on peak and luminous signals,

thereby detecting the timing for starting combustion with respect to a top dead center of said internal combustion engine.

4,492,115
METHOD AND APPARATUS FOR MEASURING DEFECTS IN FERROMAGNETIC TUBING

John E. Kahil; Mark S. Jaynes, and James E. Bradfield, all of Houston, Tex., assignors to PA Incorporated, Houston, Tex.

Filed Apr. 11, 1984, Ser. No. 599,162
Int. Cl.³ G01N 27/82, 27/72
U.S. Cl. 73—151 13 Claims



13. A method of determining the extent of defects in used tubular elements forming a tubular string after use in a subterranean oil or gas well, comprising the steps of:

determining the extent of the reduction in average wall thickness at successive positions on each tubular element at the well surface during movement of each tubular element into or out of the well;

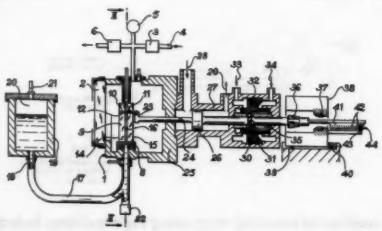
determining the extent of corrosion pitting at successive positions on each tubular element at the well surface during movement of each tubular element into or out of the well;

determining the extent of wear due to sucker rod interference at successive positions on each tubular element at the well surface during movement, into or out of the well, wherein the determination of the reduction in wall thickness, corrosion pitting, and wear due to sucker rod interference are simultaneously determined at the same position on each tubular element.

4,492,116
APPARATUS FOR THE OPTICAL OBSERVATION OF PHENOMENA IN MIXTURES

Hugues Gillier, Paris; Jean-Claude Redasse, Noisy-le-Sec, and Maurice Renaut, Aulnay sous Bois, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 23, 1983, Ser. No. 507,089
Claims priority, application France, Jun. 23, 1982, 82 10974
Int. Cl.³ G01N 21/00
U.S. Cl. 73—432 R 4 Claims

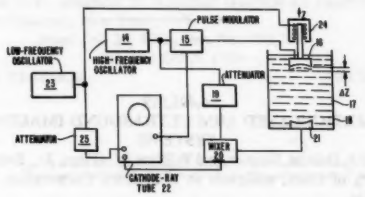


1. An apparatus for the optical observation of the evolution of instabilities between two fluids having different densities subject to high initial pressures, of the type comprising an observation chamber with parallel faces containing the two fluids, initially separated by a diaphragm, and wherein it comprises in combination the arrangement of the observation chamber within a tight enclosure equipped with static pressurizing means and whereof one face is constituted by an optical observation window parallel to the two parallel faces of the observation chamber, the diaphragm having a straight cylindrical shape and is coupled to a mechanical extraction shaft, the geometrical axes of the diaphragm and the extraction shaft being perpendicular to the faces of the observation chamber, the extraction shaft sealingly sliding through the wall of the enclosure opposite to the said window, whilst part of the extraction shaft external of the pressure enclosure is integral respectively with a piston sliding within a cylinder and which can be actuated by a high pressure fluid in order to drive the extraction shaft towards the outside of the enclosure, a mechanical device for locking and unlocking the extraction shaft and a device for stopping the extraction shaft at the end of its travel.

4,492,117
ULTRASONIC NONDESTRUCTIVE TEST APPARATUS

Noriyoshi Chubachi, Miyagi, Japan, assignor to Keisuke Honda, Aichi, Japan

Filed Nov. 5, 1982, Ser. No. 439,581
Claims priority, application Japan, Nov. 13, 1981, 56-182709
Int. Cl.³ G01N 29/00
U.S. Cl. 73—597 6 Claims



4. An ultrasonic nondestructive test apparatus for detecting variations in velocity of an ultrasonic wave propagating through an object, said apparatus comprising a focusing ultrasonic transmitting element for irradiating an object to be measured with a focused ultrasonic wave, an ultrasonic receiving element positioned with respect to said object for detecting ultrasonic energy from said transmitting element which has been subjected to a change inside the object, a low-frequency oscillator, a vibrator coupled to said oscillator for vibrating said ultrasonic receiving element with a spatial amplitude which is small in comparison with the distance between said elements and at a frequency which is low compared to that of said ultrasonic wave, and a cathode-ray tube for displaying an output from said ultrasonic receiving element, the horizontal sweep of said cathode-ray tube being synchronized with an output signal from said low-frequency oscillator used for vibrating said vibrator, so that the display shows variations in the ultrasonic propagation velocity through said object.

4,492,118
NONDESTRUCTIVE TESTING OF STRUCTURAL MATERIAL BY MEANS OF ULTRASONICS

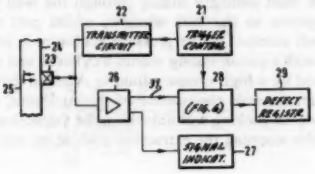
Hans-Jürgen Bäthmann, Moers; Bernhard Hoh, Hünxe, and Siegmar Schulz, Cologne, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf and Krautkraemer GmbH, Cologne, both of, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 415,830
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1981, 3135969
Int. Cl.³ G01N 29/04
U.S. Cl. 73—612 5 Claims

1. A method for nondestructive testing of structural material having front and rear surfaces and under utilization of ultrasonic test pulses set into the front surface and under further

utilization of echoes being detected as return signals emerging from said front surface, comprising the steps of:

providing a first gating and detection period for echo signals which covers at least a period in which a rear wall echo will appear;



detecting any echo signal that occurs within said period, the detected echo signal may be a defect echo or a true rear wall echo and using such detection for generating a second gating and detection period; and

detecting a rear wall echo that occurs in the second gating period as an indication of the presence of a defect.

4,492,119

ARTICULATED ARM ULTRASOUND IMAGING SYSTEMS

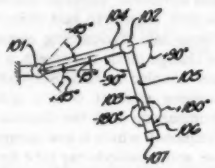
Mark J. Dulapa, Denver, and William M. Glenn, Jr., Evergreen, both of Colo., assignors to Technicare Corporation, Solon, Ohio

Filed Feb. 3, 1983, Ser. No. 463,426

Claims priority, application United Kingdom, Oct. 1, 1982, 8228094

Int. Cl.³ G01N 29/04

U.S. Cl. 73—621 **10 Claims**



1. In an ultrasonic diagnostic imaging system, including an articulated arm for mounting an ultrasonic scanner, said arm including a plurality of joints, at least two of which exhibit respectively different permitted angular ranges of movement; apparatus for processing signals indicative of the arm position comprising:

means, associated with said joints, for providing analog output signals representative of the angular position of said joints;

means, responsive to said angular position output signals, for producing a plurality of scaled analog output signals over a common dynamic range corresponding to the respective permitted angular ranges of movement of said arm joints;

means for proportionately combining ones of said scaled output signals to provide a plurality of combined angular representative analog signals; and

means for digitizing said combined angular representative analog signals.

4,492,120

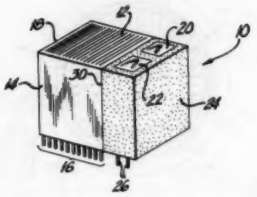
DUAL FUNCTION ULTRASONIC TRANSDUCER ASSEMBLY

George K. Lewis, Wyckoff; Franklin K. Sun, Tenafly, both of N.J.; Douglas L. Keene, Central Valley, and Howard F. Fidel, Hartsdale, both of N.Y., assignors to Irex Corporation, Ramsey, N.J.

Filed Mar. 18, 1983, Ser. No. 476,671

Int. Cl.³ G01N 29/00

U.S. Cl. 73—625 **13 Claims**



1. A dual function ultrasonic transducer assembly for performing imaging and flow measurement comprising:

an upper surface including first transducer means, occupying a first area of said surface, for sending and receiving imaging signals, and second transducer means, occupying a second area of said surface, for sending and receiving flow measurement signals;

a first backing material, located between said first transducer means and a lower surface of said assembly, said first backing material chosen to have damping characteristics for the transmission and reception of imaging signals by said first transducers means; and

a second backing material, located between said second transducer means and said lower surface of said assembly, said second backing material chosen to have damping characteristics for the transmission and reception of flow measurement signals by said second transducer means;

wherein said first and second backing materials are joined at a common interface.

4,492,121

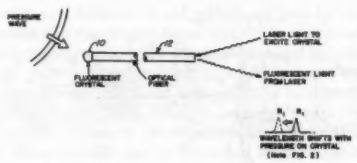
GAUGE FOR MEASURING HIGH TRANSIENT PRESSURES

Delbert L. Lehto, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 30, 1982, Ser. No. 429,692

Int. Cl.³ G01L 23/08; G01N 33/22, 21/64

U.S. Cl. 73—705 **11 Claims**



1. A method of remotely measuring high transient isotropic pressures in water comprising:

providing an elongate optical fiber waveguide;

securing a fluorescent crystal on one end of the optical fiber waveguide in optical communication therewith;

disposing the one end of the optical fiber waveguide in water in the vicinity of an underwater explosion;

launching light into the other end of the optical fiber waveguide for traveling to the one end for stimulating the

crystal to fluoresce at a wavelength responsive to pressure on the crystal;

transporting the crystal fluorescence back through the optical fiber waveguide to the other end; and,

measuring the shift in fluorescent light wavelength resulting from isotropic pressure changes on the crystal.

4,492,122

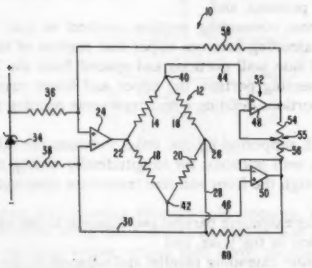
CIRCUIT FOR LINEARIZATION OF TRANSDUCER

John Dimeff, San Jose, Calif., assignor to Mark Telephone Products, Inc., Santa Clara, Calif.

Filed Jul. 2, 1982, Ser. No. 394,990

Int. Cl.³ G01B 7/18; G01L 19/00

U.S. Cl. 73—708 **19 Claims**



1. A transducer circuit comprising: first means, including a differential amplifier having a pair of output terminals, defining a transducer responsive to a stimulus; second means, including a pair of input terminals, coupled with the transducer for providing a power input thereto; and third means, including a pair of feedback resistors, coupling the respective output terminals to respective input terminals of the second means to cause a change of the current flow through the transducer as a function of a change in the stimulus to thereby cause a linearization of the output signal at the output terminals of the transducer.

4,492,123

THERMAL CONDUCTIVITY VACUUM GAGE

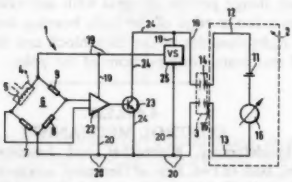
Günther Reich, Cologne, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Mar. 31, 1982, Ser. No. 364,099

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1981, 3130817

Int. Cl.³ G01N 25/00, 27/18

U.S. Cl. 73—755 **5 Claims**



1. A thermal conductivity gage for measuring the vacuum (pressure) of a gas, comprising:

at least one probe means in a probe unit including at least a temperature-dependent resistance element in thermal communication for said measuring, whereby the vacuum (pressure) of said gas affects the temperature-dependent resistance of said temperature-dependent resistance element;

an operating unit including a power supply and an indicator;

electrical conductor means for electrically connecting said probe means and said operating unit;

a measuring circuit electrically connected to said operating unit, said measuring circuit connected by said conductor means to responsive means for response to the temperature-dependent resistance of said temperature-dependent resistance element and said indicator, a measuring electric current flowing within said measuring circuit which is changed by said responsive means, whereby to allow said indicator to reflect said vacuum affect on said temperature-dependent resistance of said temperature-dependent resistance element and thereby indicate the vacuum; and

a power supply circuit to supply electrical current to said temperature-dependent resistance element and said measuring electric current,

said measuring circuit having a portion in said probe means and a portion in said operating unit, and

said power supply circuit having a portion in said probe means and a portion in said operating unit,

said portion of said measuring circuit in said operating unit being identical with (the same as) said portion of said power supply circuit in said operating unit.

4,492,124

SAMPLING SYSTEM FOR STOOL ANALYSIS

Martin Fleisher, Glen Cove, and Sidney J. Winawer, New York, both of N.Y., assignors to Memorial Hospital for Cancer and Allied Diseases, New York, N.Y.

Filed Jul. 30, 1982, Ser. No. 404,201

Int. Cl.³ G01N 1/08

U.S. Cl. 73—864.44 **9 Claims**

1. A sampling system for stool analysis comprising an elongated handle and a cylindrical coring device, said handle including means for holding said coring device which comprises a structure operable to be force-fitted into said coring device.

4,492,125

PUSH-BUTTON TUNER

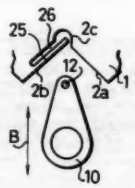
Hiroyasu Miyata, Furukawa; Akio Yamaguchi, and Keizo Watanabe, both of Iwaki, all of Japan, assignors to Sanshin Electric Co., Ltd., Kanagawa, Japan

Filed Apr. 23, 1982, Ser. No. 371,508

Claims priority, application Japan, Apr. 25, 1981, 56-59215[U]

Int. Cl.³ F16H 35/18; H03J 5/06

U.S. Cl. 74—10.33 **6 Claims**



1. A push-button tuner having an elongate slide ember adapted to be moved longitudinally for tuning the tuner, said slide member having means formed by inclined portions of a side edge thereof for sliding said member longitudinally upon receiving a thrust force perpendicular to the longitudinal direction of movement of said slide member, means including a

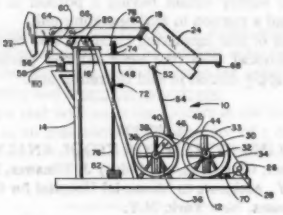
lock member movable in the direction perpendicular to said longitudinal direction of movement and carrying a cam adapted to engage said inclined portions for sliding said slide member longitudinally upon applying a thrust force to said inclined portions form said cam, said inclined portions being formed at least in part by means including an elastic element secured at one end portion of said side edge for deflecting inwardly under a thrust load applied by said cam.

4,492,126

VARIABLE LEVERAGE OIL FIELD PUMP JACK

C. Arthur Davis, P.O. Box 2114, Ada, Okla. 78420

Filed May 17, 1982, Ser. No. 378,509
Int. Cl.³ F16H *21/32*
U.S. Cl. 74—41 **19 Claims**



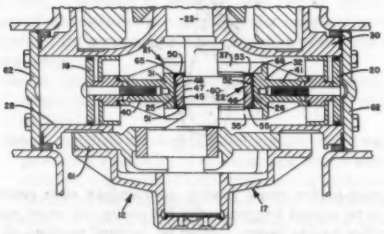
1. A pump jack comprising:
a post;
a walking beam pivotably mounted on said post for oscillating on its pivot with respect to said post, roller engagement means on said walking beam away from its pivot, said walking beam having means thereon for connection to pumping equipment;
a leverage beam pivotably mounted with respect to said post, said leverage beam having a roller rotatably mounted thereon on a fixed rotational axis during operation for engaging said walking beam for urging said walking beam to rotate upon its pivot; and
a crank connected to said leverage beam for oscillating said leverage beam when said crank is turned so that rotation of said crank causes oscillation of said leverage beam which, in turn, causes oscillation of said walking beam to produce pumping motion.

4,492,127

MOTOR-COMPRESSOR UNIT

Gerhard Kuhn, Cypress, Calif., and John J. Jacobs, Flint, Tex., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 29, 1982, Ser. No. 437,730
Int. Cl.³ F16H *21/18;* F04B *35/04*
U.S. Cl. 74—50 **4 Claims**



1. A yoke and slide block combination comprising:
a yoke including
a left longitudinally extending side wall portion,
a right longitudinally extending side wall portion spaced from the left side wall portion,
a lower front connecting portion secured to and transversely extending between lower front regions of the left and right side wall portions,
an upper front connecting portion secured to and transversely extending between upper front regions of the left and right side wall portions and spaced from the lower front connecting portion, the upper and lower front connecting portion, the upper and lower front connecting portions defining a front transverse opening therebetween,
a lower rear connecting portion secured to and transversely extending between lower rear regions of the left and right side wall portions, and
an upper rear connecting portion secured to and transversely extending between upper rear regions of the left and right side wall portions and spaced from the lower rear connecting portion, the upper and lower rear connecting portions defining a rear transverse opening therebetween;
a slide block supported by the yoke, between the left and right side wall portions, for longitudinally sliding movement through the front and rear transverse openings, and including
a left shoulder extending parallel and adjacent to the left side wall portion of the yoke, and
a right shoulder extending parallel and adjacent to the right side wall portion of the yoke;
a left rail bearing secured to the left side wall portion of the yoke to facilitate sliding movement between the slide block and the yoke, and including
a left bearing surface disposed between the left side wall portion of the yoke and the left shoulder of the slide block,
an upper flange portion integral with and extending inward from an upper edge of the left bearing surface, between the left shoulder of the slide block and the upper front and rear connecting portions of the yoke, and
a lower flange portion integral with and extending inward from a lower edge of the left bearing surface, between the left shoulder of the slide block and the lower front and rear connecting portions of the yoke; and
a right rail bearing secured to the right side wall portion of the yoke to facilitate sliding movement between the slide block and the yoke, and including
a right bearing surface disposed between the right side wall portion of the yoke and the right shoulder of the slide block,
an upper flange portion integral with and extending inward from an upper edge of the right bearing surface, between the right shoulder of the slide block and the upper front and rear connecting portions of the yoke, and
a lower flange portion integral with and extending inward from a lower edge of the right bearing surface, between the right shoulder of the slide block and the lower front and rear connecting portions of the yoke.

4,492,128

CONTROL MECHANISM

Walter Heidelberger, Klarenthal, and Joachim Morsch, St. Wendel, both of Fed. Rep. of Germany, assignors to bso Steuerungstechnik GmbH, Sulzbach, Fed. Rep. of Germany

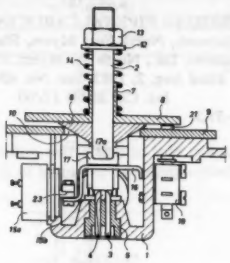
Filed Apr. 21, 1982, Ser. No. 370,203
Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117414
Int. Cl.³ G05G *9/04;* H01C *10/16;* H01H *25/04*
U.S. Cl. 74—471 XY **5 Claims**

1. A control mechanism comprising
a housing;
a guide plate mounted on said housing, said plate having an opening therein;

at least one electrical component having an operator element extending through said guide plate adjacent said opening;

a control lever extending through said opening, said control lever having a handle end outside of said housing and a coupling end mounted within said housing to permit movement of said lever in various directions from a control, rest position;

a frustoconical pivot member slidably mounted coaxially on said control lever with the smaller end thereof extending



into said housing through said opening, the larger end thereof being dimensioned to engage said opening;

a restoring spring urging said pivot member toward said coupling end of said lever;

a control plate attached to the larger end of said pivot member for tilting movement with said pivot member and said lever between a rest position with the rest position of said lever in which said control plate engages said operator element and tilting positions in which said element is not engaged.

4,492,129

SHIFT LEVER FOR AN AUTOMOTIVE TRANSMISSION

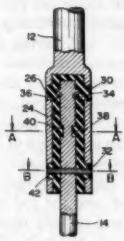
Hideo Hasegawa, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Apr. 27, 1982, Ser. No. 372,390

Claims priority, application Japan, Apr. 28, 1981, 56-64688

Int. Cl.³ B60K *20/60*; G05G *1/10*

U.S. Cl. 74—473 R **4 Claims**



1. A shift lever for an automotive transmission, comprising:

(a) a first shaft having a first hole and a second hole opening to the first hole;

(b) a second shaft extending partially into the first hole;

(c) a resilient member located in the second hole and in a section of the first hole forming a space between the first and second shafts, the resilient member completely surrounding the second shaft within the first hole and adhering to both of the first and second shafts; and

(d) a rod mounted on the second shaft and extending into the first and second holes, the rod extending in the resilient member located in the first and second holes and being spaced from the first shaft by the resilient member, said resilient member extending continuously into the second hole from a portion thereof in the first hole.

4,492,130

DEVICE FOR FILTERING OUT VIBRATIONS AND NOISE

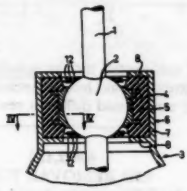
Jean-Michel Lamy, Paris, and Albert Le Bail, Nanterre, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Aug. 13, 1982, Ser. No. 408,121

Claims priority, application France, Aug. 14, 1981, 81 15743

Int. Cl.³ G05G *9/12*; F16C *11/08*

U.S. Cl. 74—473 P **4 Claims**



1. In an automotive vehicle gearshift control assembly having a gear control lever with a ball thereon, a spherical bearing cup surrounding said ball, and a lever-ball support housing having an inner surface,

a hollow one-piece filter component for filtering noise and vibration, located between said spherical bearing cup and said support housing,

said filter component being made of a material having a Shore hardness of between 50 and 70 and having

a massive base with an inner surface connected to said cup and an outer surface facing the inner surface of said housing,

protuberances extending out from said outer surface and having a width greater where they meet said base than at their tip and a height smaller than their thickness where they meet said base and at least equal to the width of the protuberances where they meet said base,

said protuberances occupying, where they meet said base, only a small portion of said outer surface of said base from which they project,

only the tips of said protuberances bearing against said housing when no significant load is applied, and thus being effective for filtering vibration and noise,

while under the effect of load applied when operating the gear control lever, said protuberances are crushed elastically until, after a limited idle travel corresponding to the height of said protuberances, said massive base comes into contact with said housing and then transmits said load without significant deformation of said massive base.

4,492,131

FLYWHEEL

Werner Auer, Wiesenbach, Fed. Rep. of Germany, assignor to Teldix GmbH, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 365,474, Apr. 5, 1982, abandoned. This application Apr. 6, 1984, Ser. No. 597,216

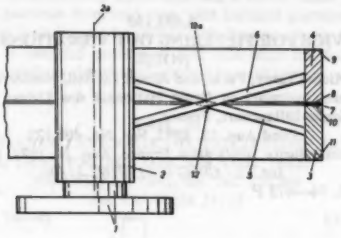
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114798

Int. Cl.³ F16F *15/10*

U.S. Cl. 74—574 **14 Claims**

1. A flywheel comprising: a hub for a bearing unit; a flywheel mass including at least two partial masses; and independent connecting means each connecting said hub with a respective one of said at least two partial masses, each respective partial mass and independent connecting means representing a partial system, wherein said partial systems are constructed such that each exhibits a resonance step-up at a differ-

ent resonant frequency when subjected to an external excitation to damp at least one of axial and radial vibrations of said



flywheel that are caused by the external excitation, thereby reducing the stress on said hub as a result of resonance step-up at a respective one of said different resonant frequencies.

4,492,132

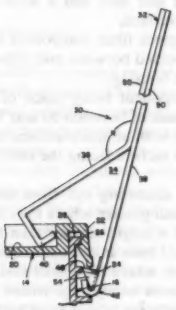
LID REMOVAL TOOL

Richard P. Obey, 5 Warden St., Apt. 6, Saugus, Mass. 01906

Filed Jun. 3, 1983, Ser. No. 500,929

Int. Cl.³ B67B *7/00*

U.S. Cl. 81—3.1 R **6 Claims**



1. For removing relatively rigid, heavy-gauge lids of synthetic material, of the type having a top surface and a substantial, downwardly extending rim which ends in a continuous lip, said rim designed to provide a tight fit on bulk containers, said lid being removable only after the downwardly extending lip of said rim is cut at spaced apart points about the circumference,

a tool enabling easy removal of said lid without normally experienced difficulties,

said tool comprising a rigid shaft,

one end of said shaft adapted for use as a handle, and

a forked construction at the other end of said shaft, defining two arms configured and arranged to engage about said rim of said lid,

the first arm having at its outer end a portion shaped to rest on the top surface of said lid and adapted to serve as a fulcrum during removal of said lid,

the second arm having at its end a rim-gripping formation shaped to grip the lip of said downwardly extending rim, and an upwardly directed cutting edge adapted to move upwardly during inward rotation of said handle in a manner to progressively cut said lip and locally sever said rim, and said rim-gripping formation adapted to engage and pull upwardly said rim during rotation of said handle,

whereby to remove said lid, at several points spaced around the circumference of said rim, said tool can be engaged about said rim, the end portion of said first arm resting on the top surface of said lid, the end portion of said second arm positioned to grip said lip and said cutting edge engaged on said lip, and the handle portion of said tool can be moved inwardly rotating about said fulcrum to cause said cutting edge to cut said lip and locally sever said rim and to cause the end portion of the second arm to grip the lip of said rim and pry it outward and upward to facilitate removal of said lid.

4,492,133

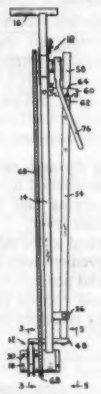
UNDERGROUND PIPE OR CABLE INSTALLATION

William O. Schosek, North Fort Myers, Fla., assignor to Elephant Industries, Inc., North Ft. Myers, Fla.

Filed Aug. 2, 1982, Ser. No. 404,428

Int. Cl.³ B25B *17/00*

U.S. Cl. 81—57.3 **1 Claim**



1. In an underground pipe installing device wherein short installation rod segments are successively threadedly connected into an installation rod positioned in a narrow and deep operating trench for penetration by an underground pipe installing device through the earth to a remotely spaced target trench, comprising an elongated rod threader adapted to be positioned in a substantially vertical position in the narrow and deep operating trench, and having a rod segment engaging clutch and a rod segment rotational drive mechanism of the rod threader at the lower end to align short installation rod segments with the installation rod, and a manually operated clutch actuating control and a manually operable rotational drive mechanism at the upper end of the rod threader, motion transmitting means between opposite ends of the rod threader, the opposite ends of the rod threader being connected by a tubular frame member, and the rod segment engaging clutch having a rod holder and radially pivoted cams to clampingly engage the rod segments, and manually operable means at the upper end of the rod threader to actuate the clutch.

4,492,134

APPARATUS FOR SCREWING PIPES TOGETHER

Bernd Reinboldt, Langenhagen, and Hans-Christian Bock, Burgdorf, both of Fed. Rep. of Germany, assignors to Weatherford Oil Tool GmbH, Langenhagen, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 423,001

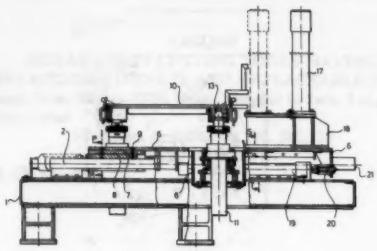
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138870

Int. Cl.³ B25B *13/50*

U.S. Cl. 81—57.34 **7 Claims**

1. Apparatus for screwing together pipes provided for the casing of boreholes, comprising a support; a slide movably

mounted on said support; a power-driven screwing clamp on said slide; a counter device on said slide; and level compensat-



ing means connecting said clamp to said counter device, including a plurality of hydraulic operating cylinders.

4,492,135

APPARATUS FOR HANDLING THIN SHEETS OF MATERIAL

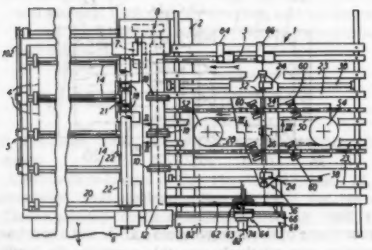
Ian D. Ginn, Sale; Leonard Gleave, Davyhulme, and Leslie Woods, Altrincham, all of England, assignors to Metal Box Public Limited Company, Reading, England

Filed Sep. 29, 1982, Ser. No. 426,750

Claims priority, application United Kingdom, Sep. 29, 1981, 8129371

Int. Cl.³ B65H 7/08

U.S. Cl. 83—155 **18 Claims**



1. Apparatus for handling thin sheets of material, such apparatus comprising at least one pair of rollers, for cooperating with each other to draw a said sheet tangentially between them, and drive means for rotating said rollers, each roller comprising a rigid roller body carrying a respective circumferential roller surface for engaging the sheet between the two roller surfaces, one roller of the pair having a first said roller surface which is immovable circumferentially with respect to the corresponding roller body, and the other roller having a draw ring encircling its body, the roller surface of said other roller being defined on the draw ring, wherein

the draw ring comprises a resilient ring member, resiliently gripping the roller body, and a relatively rigid tyre carried entirely by and encircling the ring member and having the roller surface of the draw ring, the draw ring being unsecured against circumferential movement with respect to the roller body, whereby the draw ring, as a whole, is capable of limited rotation about the corresponding roller body such as substantially to prevent slippage between either of the roller surfaces and a said sheet when the latter is engaged between the rollers.

4,492,136

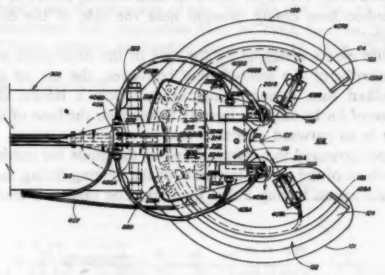
CUTTING ASSEMBLY SYSTEM FOR PIPE CASINGS AND THE LIKE

Ronald I. Walker, 2411 White St., Mobile, Ala. 36605

Filed Dec. 18, 1981, Ser. No. 331,977

Int. Cl.³ B26D 7/08

U.S. Cl. 83—169 **9 Claims**



1. A cutter system for an object having a wall to be cut which is generally circular in cross-section, such as pipe casings and the like, comprising:

an annular shaped object encircling assembly defining a centrally located object cutting area and having a basic assembly body; said body defining an open side entry area means having a predetermined width between respective ends of said basic body for allowing entry and exit of the object into and from said basic body without any supplemental opening and closing action, respectively, of said body;

an annular shaped trackway fixedly mounted on said basic body and extending substantially around the object cutting area and terminating at two ends adjacent said side entry area means thereby forming a gap having an arcuate distance between the ends of the trackway;

at least two, spaced, moveable cutter means forming an arcuate separation distance for cutting the object located in the object cutting area about three hundred and sixty degrees of the object's periphery, said at least two cutter means being mounted on said trackway by track mounting means, said track mounting means traveling along said trackway around the object cutting area a distance equal to at least one-half of their arcuate separation distance plus at least one-half said gap arcuate distance with said cutter means in cutting engagement with the object on one side of a midpoint of said trackway and a distance equal to at least one half of their arcuate separation distance on the other side of said midpoint of said trackway, producing a total of at least three hundred sixty degrees of cut.

4,492,137

APPARATUS FOR REMOVING LIGATING FITTINGS ON SMOKING CASINGS

Shingo Okada, Tokyo, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 12, 1982, Ser. No. 433,811

Claims priority, application Japan, Oct. 15, 1981, 56-153099[U]; Oct. 15, 1981, 56-153100[U]; Oct. 15, 1981, 56-153101[U]; Oct. 15, 1981, 56-153102[U]

Int. Cl.³ B26D 7/14

U.S. Cl. 83—175 **4 Claims**

1. An apparatus for removing ligating fittings of smoked ham casings comprising:

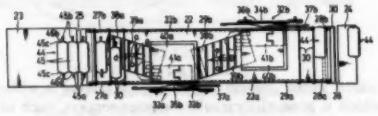
a plurality of conveyer plates mounted on a pair of endless rotary bodies and moved along a fixed deck plate for conveying smoked hams in parallel with each other along an upper surface of the deck plate;

a deflecting conveyer arranged on the deck plate aslant of the moving direction of the conveyer plates and moved with higher speed than that of the conveyer plates for conveying each smoked ham outwardly toward a side of the deck plate;

a sandwiching conveyer arranged by the side of the deck plate and moved in the same direction and with the same speed as the conveyer plates for sandwiching an ear of the smoked ham casing brought near the side of the deck plate;

a guide means arranged by the side of the deck plate and inwardly of the sandwiching conveyer, the ear of the smoked ham casing being inserted into a lateral slot thereof for leading the ligating fitting near the base of the ear in an outward direction; and

a cutter arranged in a terminal end of the guide for cutting the base of the ear off inwardly of the ligating fitting, said guide means having a first guide portion upstream and a



second guide portion downstream in the moving direction of said conveyer plates, said first guide portion including a slant surface which traverses inwardly and gradually away from said sandwiching conveyer in the downstream direction, and said second guide portion including a slant surface which traverses outwardly and gradually toward said sandwiching conveyer in the downstream direction, said second guide portion being positioned between said shoulder and said ligating fitting, while said ear is conveyed by said sandwiching conveyer, whereby said first guide portion urges said shoulder inwardly while the outer end of said ear is conveyed downstream by said sandwiching conveyer and said second guide portion urges said ligating fitting outwardly from said shoulder due to a relative extension between the outer end and the shoulder of said ear, thereby enlarging the gap between said ligating fitting and said shoulder, the base of said ear being cut off by said cutter within said enlarged gap.

4,492,138
APPARATUS FOR DELIVERING WEB MATERIAL OR THE LIKE FROM ROLLS

Theo P. C. Breuers, Venlo; Andreas T. Heijnen, Tegelen, and Arie Leppink, Venlo, all of Netherlands, assignors to Océ-Nederland B.V., Venlo, Netherlands

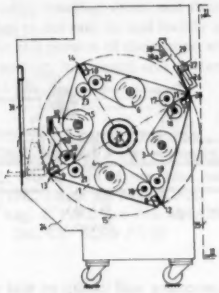
Filed Mar. 4, 1983, Ser. No. 472,145

Claims priority, application Netherlands, Mar. 10, 1982, 8200980

Int. Cl.³ G03B *27/14*

U.S. Cl. 83—203 **7 Claims**

1. An apparatus for delivering web material or the like from rolls, comprising a movable holder having thereon means for holding a plurality of supply rolls of such material and, for each of said rolls, means for unwinding a portion of the web material and transporting the unwound portion along a path separate from the paths of materials unwound from the other rolls, said holder being movable to any of a plurality of positions in each of which one of said rolls is in an active position with the free end of its web material at a certain fixed location, said holder comprising for each of said rolls a support means adapted to support the free end of an unwound portion of the related web material, each said support means being provided with a cutting edge lying at and transverse to the path of transport of such web material, and web cutting means mounted outside the path of movement of said holder and including a cutting element operable to cut off sheets by coop-



eration with any of said cutting edges when the related supply roll is in said active position.

4,492,139
DEVICE IN A MICROTOME FOR RELATIVE MOVEMENT BETWEEN THE KNIFE AND SPECIMEN HOLDER

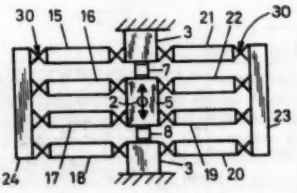
Bo Forsström, Järfälla; Tomas Luniewski, Stockholm, and Per Wikefelt, Järfälla, all of Sweden, assignors to LKB-Produkter, Bromma, Sweden

Filed Oct. 26, 1981, Ser. No. 314,969

Claims priority, application Sweden, Oct. 27, 1980, 8007527

Int. Cl.³ G01N *1/06*

U.S. Cl. 83—727 **10 Claims**



1. In a microtome of the type wherein a knife and a specimen holder comprise two relatively movable members for cutting extremely thin successive sections from a specimen the improvement which comprises mounting means for said two members for reciprocatory relative movement between the two members in a first plane and for relative incremental feeding movement between the two members in a plane disposed transversely with respect to said first plane;

said reciprocatory and feeding movements being disposed in respective straight lines normal to the line of intersection of said transversely disposed planes;

one of said two relatively movable members is hingedly connected to one end of each of a first two pairs of rigid parallel arms disposed in the plane of movement of said one member, the respective pairs of said arms extending outwardly from said one member in opposite directions from each other for hinged connection at their respective other ends to two remotely disposed elongated intermediate support elements extending generally parallel with the direction of said movement, said support elements being, in turn, hingedly connected to one end of each of a second two pairs of rigid parallel arms disposed in the plane of movement of said one member, the respective other ends of the second two pairs of arms being inwardly disposed for hinged connection to respectives ones of a pair of

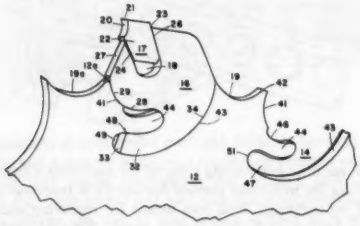
support portions of a unit adapted to support said one member for said reciprocating relative movement.

4,492,140

ROTARY SLOT CUTTING TOOLS HAVING REPLACEABLE INSERTS AND REPLACEABLE SEATS

Joseph Pano, Shavey-Zion, Israel, assignor to Iscar Ltd., Nahariya, Israel

Filed Jun. 4, 1982, Ser. No. 385,173
Int. Cl.³ B27B *33/08*
U.S. Cl. 83—839 **9 Claims**



1. An improved rotary cutting tool arrangement, said cutting tool arrangement comprising:
a disc-shaped body,
a plurality of peripheral recesses on said body,
replaceable seats each configured to self-lock into one recess due only to locking forces between said body and said seat,
replaceable cutting inserts, and
means independent of the locking forces between said body and said seat for lockingly inserting and locking said insert to said seat, without relative motion between said body and said seat.

4,492,141

SABER SAW BLADE

Eiji Takeuchi, 18-4 Jounancho, Sanjo-shi Niigataken, 951, Japan

Continuation-in-part of Ser. No. 246,912, Mar. 23, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 428,640
Claims priority, application Japan, Dec. 15, 1980, 55-176702
Int. Cl.³ B27B *33/02*
U.S. Cl. 83—852 **9 Claims**

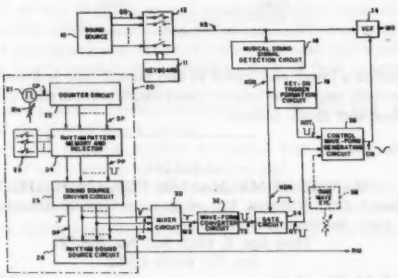
1. A saber saw for cutting in parallel, perpendicular and oblique directions relative to a wood grain, the saber saw comprising:
a blade having a plurality of teeth, said plurality of teeth being alternatively and oppositely faced to define alternating, shallow and deep recesses along a side of said blade;
each tooth having a cutting edge, a tooth face and an upper triangular face on said tooth face;
said cutting edge extending from a top of said tooth to a deep recess at an inclination angle in the range of 90° to 120°;
said tooth face ectending from a top of said tooth to a shallow recess at a releaf angle in the range of 10° to 45°; and
said upper triangular face being formed on the top of said tooth.

4,492,142

TIMBRE MODULATION CIRCUIT FOR ELECTRONIC MUSICAL INSTRUMENTS

Akiyoshi Oya; Akira Nakada, and Tutomu Suzuki, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 188,575, Sep. 18, 1980, abandoned, which is a continuation of Ser. No. 003,476, Jan. 15, 1979, abandoned. This application May 26, 1982, Ser. No. 382,309
Claims priority, application Japan, Jan. 18, 1978, 53-3928
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—1.03 **5 Claims**



1. An electronic musical instrument comprising:
keyboard means having a plurality of keys;
tone signal generating means for generating a tone signal each time when at least one key among said plurality of keys is depressed, said tone signal having a frequency corresponding to the depressed key;
automatic rhythm accompaniment means which comprises tempo clock pulse generating means for generating tempo clock pulses, rhythm pattern signal generating means for generating a rhythm pattern signal in response to said tempo clock pulses, said rhythm pattern signal being a signal expressing a pattern of a certain rhythm, and sound source means for converting said rhythm pattern signal into a rhythm sound signal which is a musical tone signal different from said tone signal and representing a rhythmic sound of at least one rhythmic musical instrument;
control means responsive to said rhythm pattern signal for producing a control signal whose waveform is different from that of said rhythm pattern signal;
variable filter means receiving said tone signal from said tone signal generating means and having a control input terminal to which said control signal from said control means is applied to alter an amplitude-frequency characteristic of said variable filter means whereby the timbre characteristics of said tone signal from said tone generating means are caused to vary in synchronism with a generation timing of said rhythm sound signal.

4,492,143

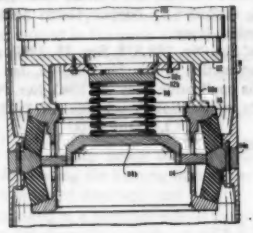
ANTI-ROTATION MASS SUPPORT SYSTEM PARTICULARLY FOR MISSILE SUPPORT

Philip G. Ruhle, Los Gatos, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 31, 1983, Ser. No. 499,629
Int. Cl.³ F41F *3/04*
U.S. Cl. 89—1.816 **2 Claims**

1. An anti-rotation shock absorber system for supporting a missile comprising: a substantially cylindrical launch tube; a substantially circular support pad for the missile disposed within said launch tube; said support pad being joined at an outer portion thereof to an elastomer shock isolator that is joined to said launch tube; said support pad also being joined at an inner portion thereof to an upper end of a metal bellows that

is centrally located thereunder and resists rotation while permitting axial, tilt and radial movement; said metal bellows



having a lower end joined to said launch tube in a manner to provide said metal bellows mechanically in parallel with said elastomer shock isolator.

4,492,144

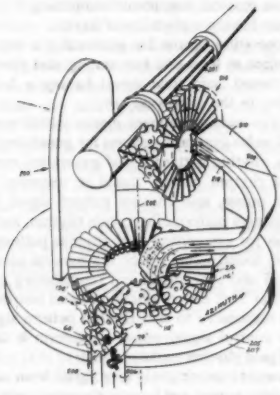
TRANSPORT MECHANISM FOR AMMUNITION

Joseph Dix, Williston, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Apr. 5, 1982, Ser. No. 365,727

Int. Cl.³ F41D *10/02*

U.S. Cl. 89—33.17 **8 Claims**



1. A weapon system comprising:

a gun which is journaled for rotation about an axis with respect to a support;

an ammunition supply means which is stationary with respect to said support;

a differential means journaled for rotation about said axis with respect to said support and including a plurality of compartments in a circular row about said axis, each compartment for receiving a round of ammunition or a fired case;

a first ammunition transport means which is stationary with respect to said support and which is coupled to and between said supply means and said differential means;

a second ammunition transport means which is coupled to and between said gun and said differential means;

said first and second transport means serving to respectively insert or extract rounds or cases into said compartments of said differential means so that the number of compartments containing either a round or a case is constant at all relative rotational positions of said gun and said supply means.

4,492,145

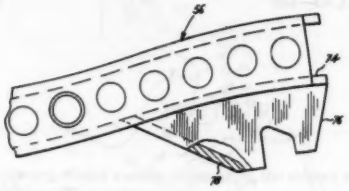
FEEDING MECHANISM FOR A GAS OPERATED MACHINE GUN

George F. Curtis, Sanford, Me., assignor to Maremont Corporation, Carol Stream, Ill.

Division of Ser. No. 193,835, Oct. 3, 1980, Pat. No. 4,395,938. This application Jun. 2, 1983, Ser. No. 500,533

Int. Cl.³ F41D *10/08*

U.S. Cl. 89—33.2 **2 Claims**



1. In a machine gun having a barrel for receiving a cartridge and guiding the projectile thereof forwardly in response to the firing of the cartridge, feed tray means for receiving and supporting a belt of cartridges, cover means for said feed tray means movable between an open loading position and a closed firing position, a bolt assembly mounted for repetitive cycles of reciprocating movement between rearward and forward limiting positions including a forward stroke under the urging of spring means for transferring the leading cartridge of the cartridge belt when disposed in a transfer position on said feed tray means into said barrel and firing the same, trigger mechanism for releasably retaining said bolt assembly in said rearward position, means responsive to the generation of gas pressure within the said barrel on the firing of a cartridge therein for moving said bolt assembly through a rearward stroke to strip the spent cartridge shell from said barrel, and cam means carried by said cover means for movement therewith and operatively engageable with said bolt assembly when said cover means is moved to said closed position with said bolt assembly in said rearward position for moving the belt to feed the leading cartridge into said transfer position in response to a rearward stroke of said bolt assembly, the improvement which comprises said cam means being provided with means for guiding and thereby enabling said bolt assembly to be manually moved through a rearward stroke and snapping into operative engagement with said cam track means following movement of said cover means into said closed position with said bolt assembly in said forward position, wherein the cam means comprises contoured inverted trough means extending generally longitudinally of the gun and carried by the cover means for lateral oscillation about an upright axis adjacent the rearward end of said cam means when said cover means is in the closed position, the bolt assembly includes cam follower means engageable within said trough means, and the enabling means comprises lateral flange means on the forward end of said cam means having a forwardly inclined cam rib for guiding said cam follower means into said trough means when said bolt assembly is moved through a rearward stroke following movement of said cover means to said closed position with said bolt assembly in said forward position.

4,492,146

SHUT-OFF DEVICE FOR A FLUID DRIVEN MOTOR

William Workman, Jr., Spring Lake, Mich., assignor to Cooper Industries, Inc., Houston, Tex.

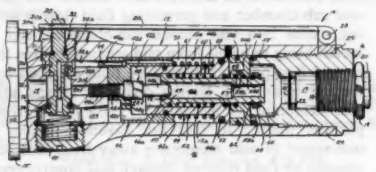
Filed Jul. 26, 1982, Ser. No. 401,906

Int. Cl.³ F15B *13/04*

U.S. Cl. 91—29 **9 Claims**

1. A device for shutting off a supply of motive fluid under pressure to an associated fluid driven motor, said device comprising a housing, a passageway for the motive fluid extending

through said housing between a fluid inlet port connected to the fluid supply and a fluid outlet port connected to the associated fluid motor, valve means shiftable to close said passageway in response to fluid pressure at said outlet port, an orifice of variable size within said passageway, a pilot piston slidably mounted within said housing and coupled to vary the size of said orifice, said pilot piston having a passageway extending therethrough and forming a portion of the motive fluid passageway, said pilot piston being responsive to predetermined



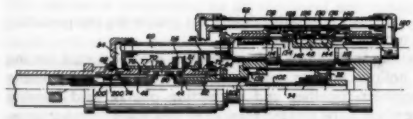
fluid pressure at said outlet port and shiftable between a first position and a second position, a restriction element cooperating with said piston passageway for defining said variable orifice, said pilot piston and said restriction element cooperating to enlarge the size of said orifice as said pilot piston is shifted between said first and said second positions and a shut-off piston slidably mounted within said housing and shiftable to close said housing passageway whereby fluid pressure at said outlet port is increased before said valve means closes said passageway.

4,492,147

RECIPROCATORY AIR MOTOR WITH CUSHIONING PISTONS

Wallace C. Knapp, Towson, Md., assignor to Knapp Pneumatics, Inc., Baltimore, Md.

Filed Dec. 30, 1983, Ser. No. 567,164
Int. Cl.³ F01L *25/06*; F01B *11/02*
U.S. Cl. 91—306 **14 Claims**



1. A reciprocatory motor having a main piston, means for providing reciprocation of the main piston in a main cylinder of the motor, and means for absorbing kinetic energy of the main piston during each stroke thereof, the energy absorbing means comprising a pair of cushion pistons received in a cushion piston housing and control means for providing relative movement between the cushion pistons on each stroke of the main piston so as to compress gas in a space between the cushion pistons and for translating the compression of gas between the cushion pistons into absorption of kinetic energy of the main piston.

4,492,148

CONTROL SYSTEM FOR A PLURALITY OF HYDRAULIC ACTUATORS

Kazunori Kuromoto, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 21, 1982, Ser. No. 451,805
Int. Cl.³ F15B *11/16*
U.S. Cl. 91—523 **1 Claim**

1. A control system for a plurality of hydraulic actuators, comprising:

a hydraulic pump;

first, second, third and fourth hydraulic actuators each having first and second chambers formed therein;

first, second, third and fourth conduits each being divided at one end thereof into two auxiliary conduits, each of said auxiliary conduits being connected with either one of said first and second chambers of different actuators;

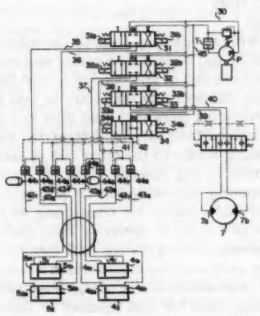
a plurality of pilot-operated check valves each being disposed in said respective auxiliary conduits for controlling the passage of fluid in a single direction from said hydraulic pump;

first solenoid-operated valve means connected at one end thereof with said hydraulic pump and at the other end with said first and second conduits for controlling flow of fluid in said first and second conduits; second solenoid-operated valve means connected at one end thereof with said hydraulic pump and at the other end with said third and fourth conduits for controlling flow of fluid in said third and fourth conduits;

first pilot pressure conduit connected with the first half of said plurality of check valves;

second pilot pressure conduit connected with the second half of said plurality of check valves; and

third solenoid-operated valve means connected at one end thereof with said hydraulic pump and at the other end with said first and second pilot pressure conduits for selec-



tively supplying fluid pressure into said first and second pilot pressure conduits thereby selectively opening said first half of and said second half of said check valves;

said first solenoid-operated valve means having a neutral position at which said first valve is closed, a first offset position at which said first conduit is connected with said hydraulic pump and said second conduit is connected with a tank and a second offset position at which said first conduit is connected with the tank and said second conduit is connected with said hydraulic pump;

said second solenoid-operated valve means having a neutral position at which said second valve is closed, a first offset position at which said third conduit is connected with said hydraulic pump and said fourth conduit is connected with the tank and a second offset position at which said third conduit is connected with the tank and said fourth conduit is connected with said hydraulic pump;

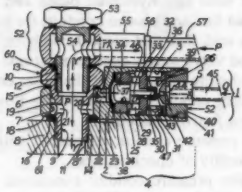
said third solenoid-operated valve means having a neutral position at which said first and second pilot pressure conduits are connected with the tank, a first offset position at which said first pilot pressure conduit is connected with said hydraulic pump and said second pilot pressure conduit is connected with the tank and a second offset position at which said first pilot pressure conduit is connected with the tank and said second pilot pressure conduit is connected with said hydraulic pump.

4,492,149

PRESSURE RELAY ADAPTED TO SIGNAL THE POSITION OF THE MOVABLE MEMBER OF A JACK

Daniel Bouteille, Ville d'Avray; Eric Petrimaux, Huest, and Jean-Luc Burban, Maisons Laffitte, all of France, assignors to Legris, Rennes, France

Continuation of Ser. No. 263,992, May 15, 1981, abandoned.
This application Aug. 19, 1983, Ser. No. 525,256
Claims priority, application France, May 23, 1980, 80 11560
Int. Cl.³ F01B *31/12*
U.S. Cl. 92—5 R 12 Claims



1. In combination, a jack and a pneumatic pressure relay the jack having a fluid receiving housing, and having a fluid inlet and having a member therein movable in response to the fluid in a chamber defined by the member and the walls of the housing, said relay

comprising:

a body with an auxiliary conduit therethrough, with first means on said body at one end of said conduit connecting said one end of said conduit to said fluid inlet of said housing and securing said body to said jack, said conduit extending from said fluid inlet to a portion of said body spaced from said fluid receiving housing thereby permitting access to the other end of said conduit from externally of said housing when the body is secured to said housing, second means on said body at said other end of said conduit for connecting said conduit to a source of supply of operating fluid under pressure for said housing for operating said member, said conduit having a cross-sectional size which is substantially equal to the cross-sectional size of said fluid inlet to permit the operating fluid for said member to flow through said conduit into said housing without substantial pressure loss, and said body having a chamber therein with an exhaust outlet and a signal outlet and having a control opening extending from said conduit to said chamber for fluid flow from said conduit to said chamber;

dividing means dividing said chamber into a first sub-chamber and a second sub-chamber and having an opening therein, said dividing means preventing the flow of fluid between said first sub-chamber and said second sub-chamber except through said opening of said dividing means, said first sub-chamber being adjacent said control opening for receiving fluid therefrom and being connected for fluid flow to said exhaust outlet and said second sub-chamber being connected for fluid flow to said signal outlet;

an elastic membrane intermediate said control opening and at least a portion of said first sub-chamber, said membrane being in fluid-tight relation with the wall of said first sub-chamber and being movable by fluid in said control opening away from the latter;

fluid feeding means on said body for supplying fluid to said second sub-chamber, said feeding means being spaced from said fluid receiving housing thereby permitting access thereto from externally of said housing when said body is secured to said housing and having an opening at said second sub-chamber for supplying a fluid to said second sub-chamber;

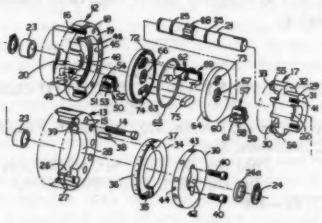
valve means in said chamber for alternately preventing fluid flow through said opening in said dividing means while permitting fluid flow through said opening in said feeding means and permitting fluid flow through said opening in said dividing means while preventing fluid flow through said opening in said feeding means for thereby interconnecting, in a first position thereof, said first sub-chamber and said second sub-chamber for fluid flow therebetween and preventing fluid flow from said feeding means into said second sub-chamber and for alternately, in a second position thereof, preventing fluid flow between said first sub-chamber and said second sub-chamber and permitting fluid flow from feeding means into said second sub-chamber, said valve means being movable from said second position thereof to said first position thereof by fluid supplied by said feeding means and having operating means adjacent said membrane for moving said valve means from said position thereof to said first position thereof upon movement of said membrane away from said control opening by fluid flowing through said control opening.

4,492,150

ACTUATOR FOR MECHANICAL APPARATUS

Harlan W. Yates, 10035 Third Ave. South, Minneapolis, Minn. 55420

Filed Jul. 1, 1983, Ser. No. 509,994
Int. Cl.³ F15B *15/24*
U.S. Cl. 92—13.6 10 Claims



1. A variously adjustable device for producing reciprocating rotary motion, comprising:

a housing including a pair of housing members each having a hollow interior, means interconnecting said housing members together and permitting one of said housing members to be rotated relative to said other housing member;

means defining a shaft extending through said housing;

chamber defining means in said housing to form the interior thereof into a pair of axially separated chambers, said chamber defining means being revolvable relative to said housing;

vane means connected with said chamber defining means and projecting into said chambers;

a fixed stop member mounted in one of said chambers in obstructing relation with said vane means, said fixed stop member having opposite sides;

a pair of primary ports in said housing connected in communicating relation with a source of fluid under pressure and communicating with one of said chambers, one of said ports being located on one side of said fixed stop member and the other port being located on the other side of said fixed stop member;

a pair of transfer ports in said chamber defining means interconnecting said chambers in communicating relation, one of said transfer ports interconnecting said chambers on one side of said vane means and the other transfer port interconnecting the chambers on the other side of said vane means, whereby when fluid under pressure is introduced through one of said primary ports into said one chamber, said vane means and chamber defining means

will be rotated in one direction, and when fluid under pressure is introduced into said one chamber through the other primary port, the vane means and chamber defining means will be revolved in the opposite direction; and

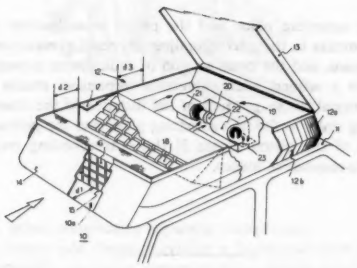
a movable stop member mounted in the other of said chambers of said housing in obstructing relation with said vane means and being movable with said one housing relative to said other housing for variously adjusting the position of said stop member relative to said fixed stop member whereby the amount of reciprocating movement of the vane means and chamber defining means may be variously adjusted.

4,492,151

AIR PRESSURIZERS/CONDITIONERS ESPECIALLY FOR WORK CABS IN A POLLUTED ATMOSPHERE

Eliane Mattei, 11 bij rue Chevalier, 94210 Lavarenne St. Hilaine, France

Filed Mar. 3, 1983, Ser. No. 471,826
Claims priority, application France, Mar. 5, 1982, 82 03663
Int. Cl.³ B60H *3/00*
U.S. Cl. 98—2.11 **6 Claims**



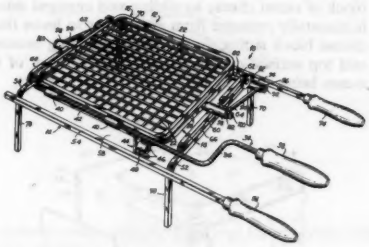
1. Air pressurizer/conditioner for work cabs in a polluted atmosphere, especially the driving cabs of agricultural tractors, this equipment comprising an air treatment unit mounted or built into the roof of a cab, this unit being equipped on the inside with at least one coarsefilter element for eliminating the solids, such as tree leaves and grit, a fine filter element, for dust removal and an activated-charcoal cell for stopping the harmful gases and vapours by absorption, and finally a turbo-fan assembly for sucking in the outside air and conveying it, filtered and purified, to the working cab, this air pressurizer/conditioner being characterized in that, on the one hand, the air treatment unit takes the form of a box, preferably the general form of a parallelepipedic box, which has, on one of its front faces a suction orifice extending over the greater part of this face to allow access to the front face of the coarse filter element and to the front face of the fine filter element, these said faces being attached mechanically and without a leak to an intermediate leakproof frame, in that, on the other hand, the turbo-fan assembly is located inside the box downstream of the filter elements so that the air passes through the said filter elements as a result of suction and is delivered purified into the working cab through a diffuser, and further in that the pressurizer is provided with a pressurization monitoring device and a toxicity detector for the air forced into the cab, characterized in that the pressurization and toxicity monitoring device comprises, on the one hand, a differential pressure controller having a pressure intake in the cab and a pressure intake outside the cab, this pressure controller feeding a pressurization indicator in the cab, and, on the other hand, a pulse counter associated with a divider bridge having as many ratios as the turbo-fan assembly has flow speeds, this counter displaying, in corrected time, the effective working time of the chemical filter as a function of the flow speeds of the turbo-fan, and further a toxicity detector incorporating, on a replaceable support located in the path of the air forced into the cab, several reagent pellets which by a change of colour reveal, from a certain threshold, the presence of polluting chemical bodies.

4,492,152

ROTATABLE COOKING DEVICE

Michelangelo DeSantis, 9 Ave. A, Port Washington, N.Y. 11050

Filed Apr. 1, 1983, Ser. No. 481,374
Int. Cl.³ A47J *37/06*
U.S. Cl. 99—397 **17 Claims**



1. A cooking device disposable above a heating means for cooking an article of food comprising:

a grill assembly comprising first and second grills and means for releaseably securing said grills together in confronting spaced relation whereby the article to be cooked is releaseably securable in the space between said grills;

a post having one end secured to said grill assembly;

a frame having an opening for receiving said grill assembly, said frame defining a channel along one side thereof and a space communicating with the top of said channel, said channel being dimensioned for slidably receiving the other end of said post, said space accommodating disengagement of said post from said channel;

a pivot arm, means for rotatably securing said pivot arm at one end to said frame and at the other end to one side of said grill assembly substantially at the midpoint thereof; and

handle means secured to said grill assembly for rotating said assembly substantially 180? about the axis thereof aligned with the rotation axis of said other end of said pivot arm for alternately exposing opposite surfaces of said food article to said heating means, said post traversing said channel during each rotation of said assembly.

4,492,153

KNOCK-DOWN PLASTIC CHEESE CURING CONTAINER

Paul P. Grabowski, Mt. Prospect, Ill., assignor to Kraft, Inc., Glenview, Ill.

Filed Dec. 13, 1982, Ser. No. 449,150
Int. Cl.³ A23C *19/00*
U.S. Cl. 99—460 **14 Claims**

1. A knock-down cheese curing box comprising

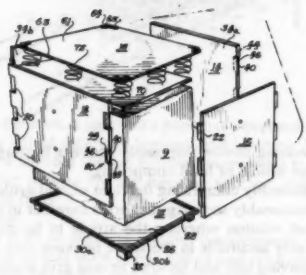
a first pair of plastic, opposed, individually constructed, unitary, rectangular side panels each having a flat, smooth cheese-contact interior surface and vertical edges,

a second pair of plastic, opposed, individually constructed, unitary, rectangular side panels, each having a flat, smooth, cheese-contact interior surface and vertical edges,

each of said first pair side panels having notch means along each vertical edge providing for joining to said second pair side panels and each of said second pair side panels having tab means along each vertical edge for sliding horizontally inward into noninterlocking engagement with said notch means forming a tubular configuration of said pairs of side panels, said notch means and said en-

gaged tab means restraining vertical movement of said side panels relative to each other,

an individually constructed, rectangular, plastic bottom tray, said bottom tray having a flat bottom panel and leg means for supporting said bottom panel above a support surface to allow lifting apparatus to be inserted therebelow, said bottom panel having an upper surface with lip means upstanding therefrom for locating said tubular configuration of side panels freestanding on an area of said top surface defined inward of said lip means, said lip means being of such minimal height as to permit said tubular configuration to be collapsed while filled with a block of cured cheese by sliding said engaged side panels horizontally outward from each other to leave the cured cheese block sitting on said self-supporting bottom tray, said top surface of said bottom panel interior of said lip means being flat and smooth for cheese contact,



said side panels and said bottom tray being formed having solid outer plastic skins and porous plastic interior cores,

a plastic pressure plate having peripheral dimensions substantially matched to the interior dimensions of said tubular configuration and having a smooth, flat, cheese-contact lower surface,

an individually constructed cover adapted to overlie said tubular configuration,

means interposed between said cover and said pressure plate for biasing said pressure plate away from said cover,

means for restraining said side panels in interfitted relationship to each other, and

means for holding said cover means downward over said tubular configuration with said biasing means exerting downward pressure on said pressure plate.

4,492,154

OVERLOAD PROTECTION IN PRESSES

Werner Rupp, Heiningen, and Johannes Koch, Weilheim, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Goeppingen, Fed. Rep. of Germany

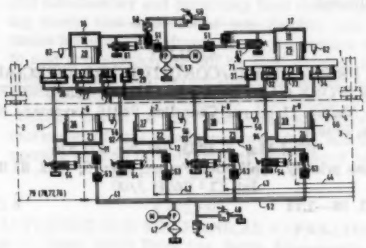
Filed Jan. 20, 1984, Ser. No. 572,305

Claims priority, application European Pat. Off., Jan. 22, 1983, 83100561.6

Int. Cl.³ B30B *1/32*

U.S. Cl. 100—53 **4 Claims**

1. An overload protection for presses, comprising connecting rod means for driving the press in a first actuating plane and in a second actuating plane remote to the first actuating plane, a plurality of working stages, ram means driven by said connecting rod means and acting on said working stages, at least one overload pressure-responsive means coordinated to each working stage, each overload pressure-responsive means having a pressure space means, the overload pressure-responsive means being operatively connected in common to adding pressure-responsive means and the value of the overall overload protection of each adding pressure-responsive means being adjusted smaller than the sum of the values of the individual overload protections of the overload pressure-responsive means, one pressure space means in a first adding pressure-responsive means and one pressure space means in a second adding pressure-responsive means being coordinated to the pressure space means of each overload pressure-responsive means, a piston means for each pressure space means, and the cross section of each piston means acted upon in the first adding pressure-responsive means being proportional to the product of the distance of the connected working stage to the



second actuating plane and the piston cross section of the piston means in the corresponding overload pressure-responsive means, and the cross section of each piston means acted upon in a second adding pressure-responsive means being proportional to the product of the distance of the connected working stage to the first actuating plane and the piston cross section of the piston means in the corresponding overload pressure-responsive means.

4,492,155

SIEVE BELT PRESS

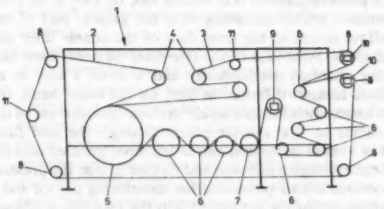
Robert Wolkenstein, Liezen, Austria, assignor to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Mar. 30, 1983, Ser. No. 480,273

Claims priority, application Austria, Apr. 1, 1982, 1303/82

Int. Cl.³ B30B *9/24*

U.S. Cl. 100—118 **6 Claims**

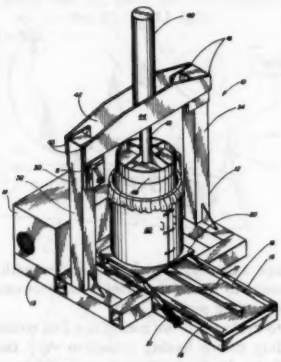


1. Sieve belt press, in which the material to be dewatered is pressed between two endless sieve belts which pass in common in a dewatering area over a plurality of common rolls and then separately over separate rolls in the area downstream of a discharge location characterized in that in the area downstream of the discharge location both sieve belts are passed over drive rolls and in that additionally at least one drive roll is power driven within the dewatering area within which the sieve belts are in common passed over common rolls.

4,492,156
APPARATUS FOR COMPACTING REFUSE

John Zimmer, 502 Estate Dr., New Iberia, La. 70560

Filed Jan. 10, 1983, Ser. No. 456,574
Int. Cl.³ B30B *15/06*
U.S. Cl. 100—229 R 2 Claims



1. A refuse compacting apparatus comprising:

a. a frame, said frame providing a horizontal base and an upwardly extending superstructure, rigidly attached to said base;

b. a hydraulic cylinder having a movable driven ram portion and being mounted on said superstructure and being vertically oriented for extending said ram portion of said cylinder in a downward direction;

c. a compaction disk attached to a lowermost end of said ram portion and being movable with said ram portion from an upper idle position to a lower operating position;

d. a movable compaction platform securedly mounted on said base beneath said cylinder during a compacting operation and slidably removable from said base during an unloading operation;

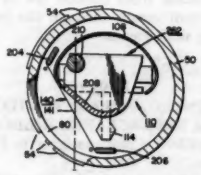
e. an open-ended cylindrical jacket assembly adapted to receive the refuse to be compacted, said jacket assembly being adapted to be releasably attached to said compaction platform and having a hinged portion on one side of a side wall and latches on diametrically opposite side of the side wall for assembling said jacket in the cylindrical operational position and disassembling it in an open-wall position during non-operation;

f. a runway portion extending upwardly from said frame to facilitate movement of said compaction platform and said jacket assembly attached thereto between an operating position when said platform is beneath said cylinder and on-operating position laterally removed from said frame, said runway portion being provided with a pair of parallel spaced apart rails and an I-beam fixedly attached between said rails, and platform being provided on its undersides with a plurality of castors slidably engaging said rails and a T-shaped groove for slidable engagement with said I-beam of said runway portion, this combination of the rails, the castors, the I-beam, and the groove facilitating back and forth movement of said platform along said runway.

4,492,157
POSTAGE PRINTING APPARATUS HAVING A MOVABLE PRINT HEAD AND A ROTATING PRINT DRUM AND RIBBON CARTRIDGE

John I. Clark, Milford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 9, 1983, Ser. No. 473,418
Int. Cl.³ B41F *11/00*; B41J *32/00*
U.S. Cl. 101—71 9 Claims



1. A postage meter printing apparatus for applying postage indicia to a mailpiece comprising:

(a) a rotary operating drum means for feeding the mailpiece through the postage meter, the periphery of the drum means having an aperture therein,

(b) means for maintaining the mailpiece against the drum means as the mailpiece is fed by the drum means,

(c) means to cycle the drum means,

(d) a non-rotating reciprocating print head means secured to a stationary support and located internal to the drum having a printing position and non-printing position, the print head means being automatically placed adjacent the mailpiece through the aperture in the drum means to its printing position, when the aperture is between the print head means and mailpiece, the print head means being an impact matrix print head, and

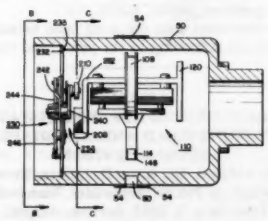
(e) a cartridge located on and rotatable with the drum means, the cartridge further containing an inked ribbon means, the print head means and inked ribbon means cooperate to print on a mailpiece, and

(f) means to activate the print head means when it is in its printing position.

4,492,158
POSTAGE PRINTING APPARATUS HAVING A MOVABLE PRINT HEAD AND A HOLLOW NON-ROTATING SUPPORT SHAFT

John I. Clark, Milford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 9, 1983, Ser. No. 473,831
Int. Cl.³ B41F *11/00, 13/36*
U.S. Cl. 101—71 14 Claims



14. A postage meter printing apparatus for applying postage indicia to a mailpiece comprising:

(a) a rotary operating drum means for feeding the mailpiece

through the postage meter to a printing position, the drum means having printing means and an internal control means,

(b) non-rotating shaft means supporting the print means for reciprocation and the drum means for rotation, the shaft means also having a passageway therethrough,

(c) means for maintaining the mailpiece against the drum means as the mailpiece is fed by the drum means through the printing position,

(d) means to cycle the drum means, and

(e) means to enable control wire means to be brought into the drum means from outside the drum means to the internal control means through the passageway of the non-rotating shaft means.

4,492,159

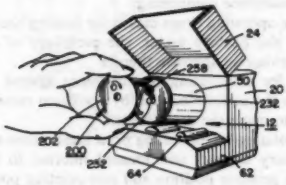
POSTAGE PRINTING APPARATUS HAVING A PRINT HEAD WITH A REPLACEABLE RIBBON CARTRIDGE

John I. Clark, Milford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 8, 1983, Ser. No. 473,842

Int. Cl.³ B41J *32/00*; B41F *11/00*

U.S. Cl. 101—71 **5 Claims**



1. A postage meter printing apparatus for applying postage indicia to a mailpiece comprising:

(a) a rotary operating drum means for feeding the mailpiece through the postage meter, the periphery of the drum means having an aperture therein,

(b) means for maintaining the mailpiece against the drum means as the mailpiece is fed by the drum,

(c) means to cycle the drum means,

(d) a reciprocating print head means located internal to the drum means having a printing position and non-printing position, the print head means being automatically placed adjacent the mailpiece through the aperture in the drum means to its printing position when the aperture is between the print head means and a mailpiece, the print head means being an impact matrix print head, and

(e) a replaceable cartridge located on and rotating with the drum means, the cartridge having first and second arms extending into the drum means, the cartridge containing an inked ribbon means, the print head means and inked ribbon means cooperate to print on the mailpiece,

(f) means to activate the print head means when it is in its printing position, and

(g) means associated with the print head means to advance the ribbon on activating of the print head means.

4,492,160

POSTAGE PRINTING APPARATUS HAVING A MOVABLE PRINT HEAD AND A VARIABLE SPEED DRUM ROTATION

John I. Clark, Milford, and Alton B. Eckert, Norwalk, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 9, 1983, Ser. No. 473,843

Int. Cl.³ B41F *13/36*, *11/00*

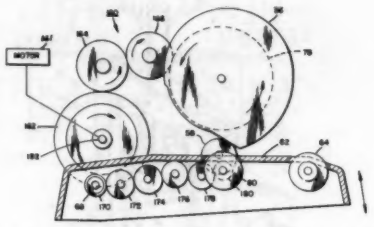
U.S. Cl. 101—71 **15 Claims**

15. A postage meter printing apparatus for applying postage indicia to a mailpiece comprising:

(a) a rotary operating drum means for feeding the mailpiece through the postage meter, the periphery of the drum means having an aperture therein,

(b) means for maintaining the mailpiece against the drum means as the mailpiece is fed by the drum,

(c) a nonrotary reciprocating impact matrix printing means secured to a stationary support and located internal to the drum means which is automatically activated to print on the mailpiece through the aperture in the drum means when the aperture is between the internal printing means and mailpiece, and



(d) a linkage assembly which cooperates with the rotary drum means to move the print head between a printing and non-printing position, and

(e) means to cycle the drum means at a first rotational speed, the cycling means having means to vary the rotational speed of the drum means to a second slower rotational speed during the time the printing means internal to the drum means is activated.

4,492,161

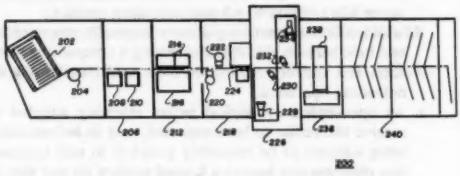
HIGH SPEED DOCUMENT ENCODING SYSTEM

Gerald L. Johnson, Garland, Tex.; Eugene C. Nolting, Gardnerville, Nev., and John H. Allen, Arlington, Tex., assignors to BancTec, Incorporated, Dallas, Tex.

Filed Oct. 1, 1981, Ser. No. 307,537

Int. Cl.³ B41J *1/36*

U.S. Cl. 101—109 **22 Claims**



1. Apparatus disposed at an encoding station for encoding discrete documents continuously moving through said station, said apparatus comprising:

a plurality of stationary character imprinters;

a plurality of striking means, each of said plurality of striking means positioned, when activated, to strike a particular and corresponding one of said plurality of stationary character imprinters;

ink bearing ribbon means disposed between said striking means and said character imprinters for transferring character imprint to said documents, said ribbon means remaining stationary during the absence of a document at said encoding station;

means continuously transporting said discrete documents through said encoding station between said plurality of character imprinters and said plurality of striking means; and

control means for advancing said ribbon in the direction of

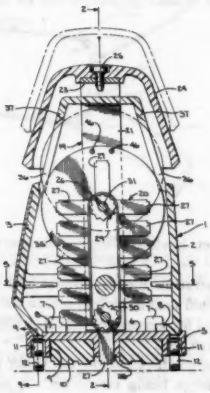
document travel and for activating particular ones of said plurality of striking means in a preselected sequence and at preselected times only in response to a document being present at said encoding station, thereby to character imprint said document as it is being continuously transported through said encoder station.

4,492,162

TYPE BAND INK STAMP

Daniel R. Nettesheim, Waukesha, and Fred W. Kufrin, Jamesville, both of Wis., assignors to Schwaab Inc., Milwaukee, Wis.

Filed Mar. 17, 1983, Ser. No. 476,054
Int. Cl.³ B41J *1/20*
U.S. Cl. 101—103 **16 Claims**



1. An improved type band ink stamp, comprising a housing having an opening in the lower end, a frame disposed within the housing, means for mounting the frame for vertical movement relative to the housing between a lower operating position and an upper adjusting position, an endless type band carried by the frame and having a plurality of type characters spaced along the length of said band, a handle operably connected to the frame whereby lowering and raising of the handle will move the frame between the operating and adjusting positions, the lowermost type character of said band projecting through said opening in said housing when the frame is in the lower operating position and said lowermost type character being disposed above said opening when said frame is in the upper adjusting position, and adjusting means including a manually adjusting member disposed in the housing for adjusting the band when the frame is in the adjusting position whereby the desired type character can be moved into alignment with said opening in the housing, said adjusting member extending through an aperture in said housing to an accessible position when the frame is in the upper adjusting position and said adjusting member being located within the housing in an inaccessible position when said frame is in the lower operating position.

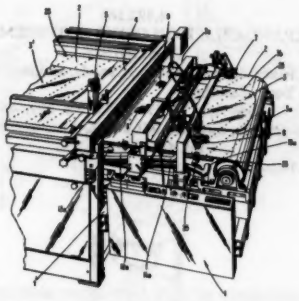
4,492,163

SILK-SCREEN PRINTING MACHINE HAVING AN ENDLESS CONVEYOR AND REGISTRATION FOR THE PRINTED ON MATERIAL

Sylve J. D. Ericsson, Storvretsvägen 48, 147 00 Tumba, Sweden

Filed Feb. 27, 1980, Ser. No. 125,197
Claims priority, application Sweden, Feb. 28, 1979, 7901808
Int. Cl.³ B41L *13/02*
U.S. Cl. 101—126 **6 Claims**

1. A silk-screen printing machine, comprising drive means for driving a material-conveying means arranged to be stopped in a first position for registering material to be printed upon, and then to convey said material to a second, printing position in which a print corresponding to a stencil pattern is applied to said material, sensing means for sensing the movement of the material from said registering position to said printing position, said sensing means generating a pulse for displacements of the material of less than 0.5 mm, said sensing means is connected to a counter, said counter having means for generating a signal when a predetermined number of pulses corresponding to the conveyed distance between said first position and said second



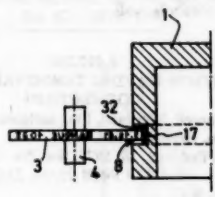
position is counted, the signal is adapted to actuate the drive means for stopping the conveying means when said material is in the second position, connecting means for controlling the drive means during a substantial portion of the transport of the material from the first to the second position over a period of rapid acceleration, substantially constant velocity and rapid deceleration, the counter controlling said drive means during the remaining small portion of the transport over a period of very low speed operation after the rapid deceleration and stopping said drive means.

4,492,164

PRINTER WITH INKER ON THE PLATEN ROLLER

Claude Cassanas, Boussy St Antoine; Jean-Pierre Conot, Brie Comte Robert, and Jacques Royer, Maisons Alfort, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 24, 1983, Ser. No. 469,537
Claims priority, application France, Feb. 26, 1982, 82 03235
Int. Cl.³ B41K *3/32, 3/56, 3/62*
U.S. Cl. 101—216 **11 Claims**



1. Apparatus for printing information on an associated information carrier which comprises a platen for carrying the information carrier, a rotary stamp for printing on the information carrier, means mounting said rotary stamp to move said record carrier between said platen and said stamp, means for delivering ink from an inking device to said stamp, said stamp printing information on said carrier by the rolling movement of said stamp on said information carrier, said platen having at least one groove having two edges and a bottom, said groove being situated between planes which bound at least one circular

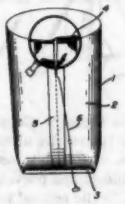
stamp surface carrying the printing faces, a part of the stamp periphery, carrying the printing faces on said circular surface, extending into said groove without touching the edges thereof at least in the absence of an information carrier, the apparatus further including a spindle mounting said stamp and a spindle mounting said platen, and reset means which act between said spindle of said stamp and said spindle of said platen to move said stamp and said groove towards each other, the bottom of said groove carrying said inking device, and said reset means urging the stamp and the bottom of the groove towards each other in the absence of an information carrier.

4,492,165

EXPANDABLE EXPLOSIVE AND STEMMING CARTRIDGE

Horst F. Marz, Otterburn Park, Canada, assignor to C-I-L Inc., North York, Canada

Filed Apr. 12, 1984, Ser. No. 599,646
Claims priority, application Canada, Aug. 8, 1983, 434111
Int. Cl.³ F42D 3/00
U.S. Cl. 102—313 **1 Claim**



1. A method of charging an upward or inclined vertical borehole in stable rock with packaged flowable explosive or stemming material using as a container for the said explosive or stemming material an elongated, flexible, thin-walled tube closed at each end and having at least one end-to-end longitudinal pleat, said pleat being sealed closed by means of an adhered, severable overcovering, the said overcovering having a fastened to it a ripcord extending beyond the borehole opening to longitudinally sever said overcovering, said method comprising elevating said container to a chosen position within the said vertical borehole and while in said chosen position operating the said ripcord to sever the said overcovering to allow said pleat to expand from the head pressure of the contained material so that said container engages and is retained by the walls of said borehole and is prevented from falling from the borehole by the frictional contact between the said container and the said borehole wall.

4,492,166

SUBMUNITION HAVING TERMINAL TRAJECTORY CORRECTION

William O. Purcell, Maitland, Fla., assignor to Martin Marietta Corporation, Bethesda, Md.

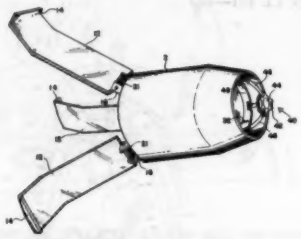
Filed Apr. 28, 1977, Ser. No. 791,805
Int. Cl.³ F42B 25/16, 25/24
U.S. Cl. 102—384 **8 Claims**

1. A bomblet having a correctible terminal trajectory and being capable of being air-dropped in a cluster together with a multiplicity of said bomblets comprising:

a body having a nose portion and a tail portion, said body carrying a warhead,

a plurality of vanes hingedly attached to said tail portion of said body, said vanes being maintained in a closed position prior to being airdropped such that said vanes are disposed longitudinally along the outer surface of said body, said vanes being arranged to change to an open position when airdropped, thereupon said vanes being caused to extend rearwardly from said tail portion, said vanes being continuously maintained in a canted attitude with respect to the longitudinal centerline of said body so as to cause said body to spin from airflow caused by dropping of said body,

heat detection means disposed in said nose portion of said body, said heat detection means having a narrow forward field-of-view, said field-of-view having a boresight line slightly displaced from the fore and aft axis of said body, thereby producing a rotating scan axis as a result of the rotation of said body, said field-of-view occuring at body spin rate in an inward spiral pattern on the ground as said bomblet approaches the ground, said heat detection means producing a detection signal when said field-of-view scans



across a target having a higher temperature than the ground,

firing pulse generation means disposed in said body and connected to said heat detection means for receiving such detection signal for generating an electrical firing pulse in response thereto, and

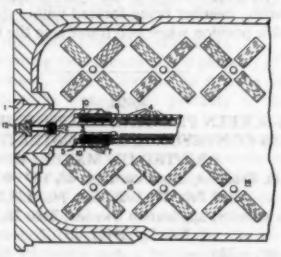
an explosive charge disposed on the outer surface of said body, said charge being connected to said firing pulse means and arranged to fire in response to such electrical firing pulse, said explosive charge producing a lateral impulse in a direction substantially perpendicular to said body upon such firing, to change the terminal trajectory of said bomblet in the direction of the target causing such detection signal.

4,492,167

PARTIALLY COMBUSTIBLE PROPELLANT CHARGE IGNITER

Uwe Brede, Fürth; Alfred Hörr, Zirndorf, and Horst Penner, Fürth, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed May 19, 1983, Ser. No. 496,256
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1982, 3226269
Int. Cl.³ F42B 9/08
U.S. Cl. 102—470 **20 Claims**



1. A partially combustible propellant charge igniter compris-

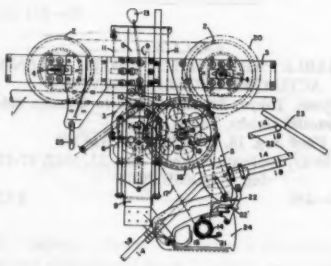
ing a metallic bottom piece accommodating an igniter charge therein, a centrally arranged ignition gas guide chamber in communication with the igniter charge for guiding ignition gas therefrom, a combustible ignition-conducting tube accommodating a propagation charge, the ignition-conducting tube being inserted into the bottom piece and extending outwardly therefrom, the propagation charge being arranged in the region of the ignition-conducting tube extending outwardly from the bottom piece, at least one cavity accommodating a separating charge and being at least partially delimited by a wall of the ignition gas guide chamber and the ignition-conducting tube portion inserted in the bottom piece, and nozzle means for establishing a communicating connection of the cavity to the portion of the ignition-conducting tube accommodating the propagation charge, the nozzle means enabling the escape of gases produced by the separating charge after ignition of the separating charge.

4,492,168

AUTOMATIC SELF-PROPELLED DEVICES FOR TRAVELLING ON A TRACK CABLE

Stelvio S. Cellai, Villa "Alba Chiara" 23, Avenue Mohamed El Karoui, Sousse, Tunisia

Filed Oct. 21, 1980, Ser. No. 199,298
Claims priority, application France, Oct. 24, 1979, 79 26940
Int. Cl.³ B61B 7/06; B61C 11/02, 13/06
U.S. Cl. 105—30 **7 Claims**



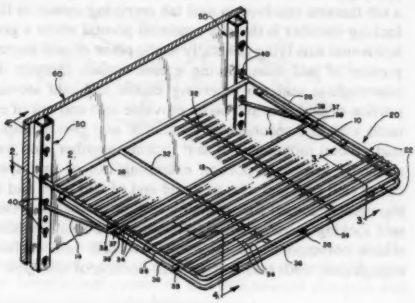
1. In a self-propelled device adapted for travelling on a track cable (1), comprising a frame (5), a driven wheel (2) that is rotatably mounted on the frame and that bears on the upper surface of the rack cable (1), and means carried by said frame (5) for forcing said wheel (2) against the rack cable (1), said means comprising lever means which carries an axle of an idler wheel (3) that bears against the underside of the track cable a distance from point of contact of said driven wheel (2) with said track cable (1) and means (25) for connection to a load (29) to be borne, such that an increase in the load swings the lever means in a direction to increase the force with which the wheels (2 and 3) are applied against the track cable; the improvement comprising means pivotally interconnecting said lever means with said frame (5) about an axle (33), both said latter axle (33) and said idler wheel (3) being located on the same side of a plane (P) containing the axis (4) of rotation of said driven wheel (2) and perpendicular to said track cable (1), said side of the plane (P) being the side that faces in said direction.

4,492,169

ADJUSTABLE CANTILEVERED SHELVING

Warren O. Ware; Gary M. Borst, and Ronald E. Abitz, all of Oshkosh, Wis., assignors to S.B.F. Corporation, Oshkosh, Wis.

Filed Apr. 5, 1982, Ser. No. 365,592
Int. Cl.³ A47B 9/00
U.S. Cl. 108—6 **5 Claims**



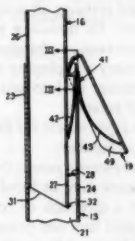
1. An adjustable cantilevered shelving comprising:
upright support means including a front member and a side member;
a shelf including a U-shaped top frame and U-shaped bottom frame, said U-shaped top frame and U-shaped bottom frame being secured together;
means extending from a rear edge of said shelf for adjustably mounting said shelf to said upright support means at a chosen vertical position;
a U-shaped bracket, including an axial portion and two arms, rotatably mounted between said U-shaped top frame and said U-shaped bottom frame of said shelf, whereby said arms pivot about the axis of said axial portion into positions above or below said shelf; and
means for detachably engaging said arms of said U-shaped bracket to said front member of said upright support means to provide support for said shelf.

4,492,170

LOCKING MECHANISM FOR VERTICALLY ADJUSTABLE TABLE

Robert A. Solomon, Kalamazoo, Mich., assignor to Am Fab, Inc., Kalamazoo, Mich.

Filed Jul. 20, 1982, Ser. No. 400,193
Int. Cl.³ A47B 9/00
U.S. Cl. 108—148 **10 Claims**



1. In a vertically adjustable table, including an upright tube and an upright post telescopically slidably received within said tube, one of said tube and post being supported on a base and the other of said tube and post having a table top supported at the upper end thereof, and including locking means cooperable

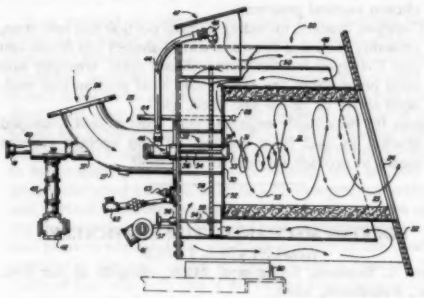
with said tube and post for releasably securing them against relative movement, the improvement comprising wherein a first wall portion of said post slidably engages a first wall portion of said tube and respective second wall portions of said tube and post on sides thereof opposite said first wall portions are spaced from each other, said second wall portion of said tube having means for receiving a tab near an end thereof, said locking means including a single piece locking member having a tab thereon received in said tab receiving means so that said locking member is thereby rendered pivotal about a generally horizontal axis lying generally in the plane of said second wall portion of said tube, having a cam surface thereon directly intermediate said tab receiving means and said second wall portion of said post and being movable into and out of engagement with said second wall portion of said post in response to said pivotal movement of said locking member, and having a manually graspable portion extending out of said space between said post and tube past said end of said tube, and including resilent means for yieldably urging pivotal movement of said locking member relative to said tube in a first direction which corresponds to movement of said cam surface into engagement with said second wall portion of said post.

4,492,171

SOLID FUEL BURNER

David F. Brashears, 790 Palmetto St., Oviedo, Fla. 32765, and Joseph T. Mollick, 122 Hickory Tree Rd., Longwood, Fla. 32750

Filed Dec. 12, 1983, Ser. No. 560,316
Int. Cl.³ F23D *1/02*
U.S. Cl. 110—261 14 Claims



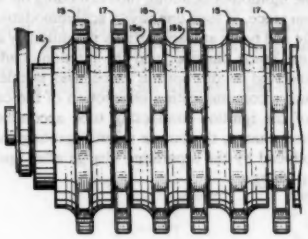
1. A solid fuel burner comprising in combination:
a combustion chamber;
a solid fuel and primary air nozzle attached to said combustion chamber for directing pulverized solid fuel and air into said combustion chamber;
solid fuel primary air spinning means for spinning said solid fuel and primary air into said combustion chamber in one direction of rotation;
secondary air input means for feeding secondary air into said combustion chamber;
secondary air spinning means for spinning the secondary air from said secondary air input means into said combustion chamber in a direction of rotation opposite in direction from said solid fuel and primary air;
gas fuel input having a flame disk positioned to feed gas into said combustion chamber in the center portion of said solid fuel and primary air nozzle; and
an auxiliary gas spud extending into said combustion chamber for directing gas thereinto, whereby said solid fuel burner is adapted to burn low density, low mass solid fuels.

4,492,172

METHOD AND APPARATUS FOR PRODUCING NON-RHIZOMING GRASSES

Jurgen Gramckow, 4096 Faria Rd., Ventura, Calif. 93001

Filed Dec. 30, 1982, Ser. No. 454,680
Int. Cl.³ A01C *5/00*
U.S. Cl. 111—1 5 Claims



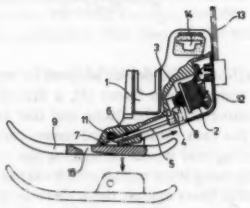
1. A method of producing a higher than normal density non-rhizoming grass sod including the steps of:
a. preparing seed beds in the form of spaced parallel troughs;
b. reducing the spacing between adjacent troughs to a value substantially less than the corresponding spacing provided for seeding grasses having rhizoming and non-rhizoming characteristics; and
c. planting seeds in said troughs at a normal rate to provide a substantially uniform seed density for all troughs whereby sufficient plant competition is provided by said spacing and seed density to force the growth upward, thereby resulting in a greatly enhanced turf appearance in a reduced period over that which would result using conventional trough spacing and the same seeding rate.

4,492,173

DETACHABLE PRESSURE FOOT WITH SOLENOID ACTUATED SECURING DEVICE

Tomonao Hirose, Tokyo, Japan, assignor to Kohshin Seimitsu Kikai Kabushiki Gaisha, Tokyo, Japan

Filed Aug. 18, 1983, Ser. No. 524,159
Claims priority, application Japan, Aug. 23, 1982, 57-127586
Int. Cl.³ D05B *29/06*
U.S. Cl. 112—240 3 Claims



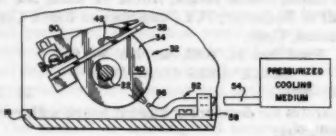
1. A detachable pressure foot mount in a sewing machine comprising: a hollow solenoid (2) fixed to a holder (1), which is, in turn, fixed to a push rod in a sewing machine; a drive rod (3) slidingly fitted in the hollow space of the solenoid and spring-biased to rise partly out of the hollow space of the solenoid; and a hold pin (5) connected to the rising end of the drive rod via a joint, and extending to a recess (7) made in the bottom of the holder, thereby catching a cross rod (11) of the pressure foot when the cross rod fits in the recess in the bottom of the holder.

4,492,174

THREAD CONTROL MECHANISM FOR SEWING MACHINES

Juergen Kaufmann, Mount Prospect, Ill., assignor to Union Special Corporation, Chicago, Ill.

Filed Feb. 16, 1983, Ser. No. 467,003
Int. Cl.³ D05B 57/00
U.S. Cl. 112—248 1 Claim



1. A cam thread pulling device for a looper thread of a sewing machine comprising:

a cam operatively driven by a rotating shaft;

a plate member including means defining an elongated opening through which said cam may extend and including thread guiding means thereon to direct thread in a direction substantially laterally across said elongated opening; and

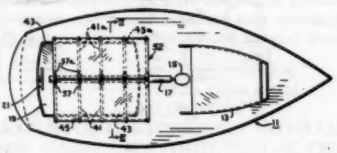
means for directing a flow of air through said elongated opening and against the looper thread whereby preventing a free end of looper thread from becoming entangled with said rotary shaft.

4,492,175

SAIL BOOM TENT

David E. Johnson, 1147 Sleepy Hollow Ct., Venice, Fla. 33595

Continuation-in-part of Ser. No. 389,712, Jun. 18, 1982, abandoned. This application Sep. 29, 1982, Ser. No. 427,867
Int. Cl.³ B63H 9/00
U.S. Cl. 114—39 9 Claims



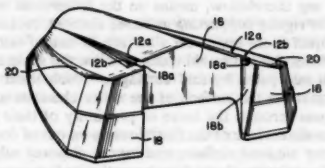
1. In a sailboat wherein a sail boom is pivotally mounted to a mast and wherein said boom is hollow and extends aft from said mast over an open cockpit, in combination with said boom, a plurality of fittings mounted longitudinally in spaced apart relationship along both sides of said hollow boom, said fittings being adapted to hold elongate members extending laterally outboard on port and starboard sides from said fittings over said open cockpit and terminating above the port and starboard sides of said cockpit, means for fastening said fittings to said boom, said fastening means comprising a bolt and nut assembly extending through said hollow boom and coacting with opposite fittings, a tubular member surrounding said bolt and extending through said hollow boom for preventing excessive tightening of said nut over said bolt and deformation of said hollow boom, means for securing said elongate members each in a respective fitting, a first flexible membrane disposed on said elongate members extending on port side, a second flexible membrane disposed on said elongate members extending on starboard side, fastener means for removably securing each membrane to said hollow boom, and fastener means for removably securing said membranes respectively to said elongate port and starboard members.

4,492,176

BOAT HULL

Juichi Arima, King County, Wash., assignor to Arima Marine International, Inc., Seattle, Wash.

Filed Jan. 4, 1982, Ser. No. 336,570
Int. Cl.³ B63B 1/00
U.S. Cl. 114—56 23 Claims



18. A motorized recreational boat with a single hull wherein the bottom of the hull of the boat comprises:

a lower hull portion extending outwardly and upwardly along at least a part of said lower hull portion length from the longitudinal center of the hull toward the port and starboard sides of the hull;

a pair of abutting strakes positioned at the upper edge of the lower hull portion of each of the port and starboard sides of the hull, each of said pairs of strakes having a first strake projecting outwardly, then upwardly from the upper edge of the lower hull portion, the second strake projecting outwardly, then upwardly from the uppermost portion of the first strake, each of said pairs of strakes forming a pair of substantially horizontal surfaces for planing and a pair of substantially vertical surfaces for resisting side slippage, each of said pairs of strakes extending from a position toward the stern of the boat to a position forward of the midportion of the hull, each of said pairs of strakes forming into a single strake extending from the midportion of the hull to a position toward the bow of the boat;

a middle hull portion extending outwardly and upwardly along at least a part of said middle hull portion length from the uppermost portion of each of said second strakes to the chine of the boat; and

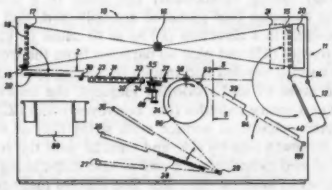
an upper hull portion extending upwardly from the chine of the boat to form the hull sides.

4,492,177

APPARATUS FOR TRANSFERRING XEROGRAPHIC IMAGES

Leo N. Vackier, Gravenwezel; Jozef L. Mampaey, Kontich, and Leo B. Alaerts, Boechout, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed May 25, 1983, Ser. No. 498,160
Claims priority, application United Kingdom, May 26, 1982, 8215318
Int. Cl.³ G03G 15/06
U.S. Cl. 118—651 9 Claims



1. Apparatus for transferring a liquid toner image from one element surface to another element surface comprising a first

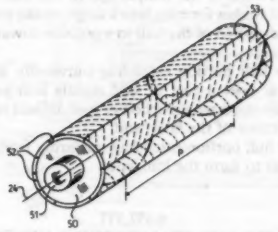
carriage movable through an arcuate path around a fixed axis, a second carriage movable through a generally horizontal path extending above and in close proximity to the top of the arcuately curved path of said first carriage, means for advancing said two carriages substantially synchronously through said paths to bring said carriages to the locus of proximity substantially simultaneously, means on the uppermost of said carriages for suspending a flexible sheetlike element by the margins thereof with the unsupported remainder of the flexible element free to sag therebelow, means on the lowermost of said carriages for rigidly supporting a second element, means for forming a liquid toner image on a surface of one of said elements which faces the other said element when the same are carried through said paths by said carriages, which toner image directly contacts the surface of the other elements as said elements pass through the locus of proximity of their paths and supports the surface of the flexible element out of contact with said other element surface, and means disposed adjacent the locus of proximity of said carriage paths for forming an electrical potential gradient across said two elements for effecting during their passage through said locus transfer of said liquid toner image from the surface on which it is formed to the other element surface.

4,492,178

APPARATUS FOR APPLYING SOLID DEVELOPER PARTICLES TO THE RECORDING ELEMENT OF A NON-IMPACT PRINTER

Jean-Philippe Voirin, Hericourt, and Bernard Cherbuy, Belfort, both of France, assignors to Cii Honeywell Bull (Societe Anonyme), Paris, France

Filed Jun. 20, 1983, Ser. No. 505,973
Claims priority, application France, Jul. 8, 1982, 82 12020
Int. Cl.³ B05C *11/02*
U.S. Cl. 118—653 **16 Claims**



1. In an apparatus for applying to the recording element (10) of a non-impact printer solid magnetically attractable developer particles contained in a tank (15), said apparatus comprising a conveyor roller (22) in the tank (15) arranged so as to bring said particles near the surface of said element (10), a baffle plate (23) positioned between said element and said conveyor roller to collect the particles conveyed by said roller, said baffle plate having a first edge (42) arranged in the immediate vicinity of said element (10) in order to form therewith a trough (43) having substantially the shape of a dihedral in which the particles thus gathered are collected, said element being movable in a direction (F) so as to cause its surface to pass the trough (43) and pick up particles from the trough, the particles carried beyond said trough remaining applied only to sensitized areas of said recording element, the improvement comprising a rotary cylinder (50), conveyor roller (22) coated on its outer cylindrical surface with strips (52) of magnetic material arranged side by side and parallel with the rotational axis (24) of said cylinder, each one of said strips being magnetized such as to have on the outer face thereof magnetic poles forming equidistant magnetic lines (53), the magnetic north (N) or south (S) polarity of which alternates from one magnetic line to the other, said magnetic lines extending in the direction of portions of helices with a constant pitch, said helices being so arranged that on two adjacent strips (52) the pitch of the helix portions of one of said two strips is the reverse of that of the helix portions of the other strip.

4,492,179

CONTROL SYSTEM FOR REGULATING THE DISPENSING OF MARKING PARTICLES IN AN ELECTROPHOTOGRAPHIC PRINTING MACHINE

Jeffrey J. Folkins; Shahid Haque; Alfred M. Loeb, and Henry R. Till, all of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 16, 1983, Ser. No. 505,014
Int. Cl.³ G03G *13/00, 15/06*
U.S. Cl. 118—689 **20 Claims**

1. An apparatus for developing a latent image with marking particles, including:

means for storing a supply of marking particles;

means for dispensing marking particles into said storing means; and

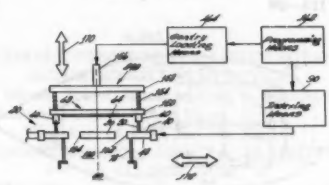
means for transporting the marking particles from said storing means to a location closely adjacent the latent image, said transporting means sensing the charge of the marking particles developed on the latent image and transmitting a signal indicative thereof to said dispensing means for regulating the discharging of marking particles into said storing means.

4,492,180

APPARATUS FOR INDEXING AND REGISTERING A SELECTED DEPOSITION MASK TO A SUBSTRATE AND METHOD THEREFOR

Richard T. Martin, Goleta, Calif., assignor to Applied Magnetics Corporation, Goleta, Calif.

Filed Mar. 16, 1981, Ser. No. 243,825
Int. Cl.³ C23C *13/08, 13/06*
U.S. Cl. 118—704 **29 Claims**



1. Apparatus for indexing and accurately registering a deposition mask in a predetermined spacing and position relative to a substrate comprising

carriage means for supporting a deposition mask having a selected number of prealigned registration members which are located therein in a predetermined pattern, said carriage means being adapted to transport said deposition mask including said prealigned registration members along a predetermined path to a deposition station;

gantry means for supporting a said substrate at a said deposition station in spaced opposed relationship to said deposition mask located at a said deposition station with said prealigned registration members thereof positioned towards said gantry means;

reference registration members which are equal in number to the selected number of prealigned registration members which are located on at least one of said gantry means and a said substrate and positioned thereon in a predetermined pattern and which are adapted to co-act with said prealigned registration members loaded thereagainst being adapted to position the gantry means including a said substrate at a predetermined spacing and position relative to said deposition mask;

indexing means operatively coupled to at least one of said carriage means and said gantry means for transporting said carriage means relative to said gantry means to index said deposition mask to said gantry means; and

gantry loading means operatively coupled to the other of said carriage means and said gantry means for moving said carriage means and said gantry means towards each other to bring said prealigned registration members and said reference registration members into engagement causing said reference registration members to be loaded against said prealigned registration members being adapted to position said gantry means and a said substrate relative to said deposition mask to accurately register a said substrate at a predetermined spacing and position relative to said indexed deposition mask.

24. The method of indexing and accurately registering a deposition mask from a plurality of deposition masks in a predetermined spacing and position relative to a substrate comprising

supporting a plurality of deposition masks each of which have a plurality of prealigned registration members formed in a predetermined pattern thereon for movement along a predetermined path;

supporting a gantry means having means for supporting a said substrate wherein at least one of the gantry means and a said substrate has a plurality of reference registration members located in said predetermined pattern and which are equal to the number of prealigned registration members on each of said plurality of deposition masks and positioned to face said prealigned registration members located on each of said deposition masks;

indexing at least one of said plurality of deposition masks to a deposition station; and

accurately registering said indexed deposition mask and a said substrate at a predetermined spacing and position by relative movement of said indexed deposition mask and said gantry means towards each other to bring said prealigned registration members and said reference registration members into engagement causing said reference registration members to be loaded against said prealigned registration members which are adapted to position said gantry means and a said substrate at a predetermined spacing and position relative to said indexed deposition mask.

4,492,181

APPARATUS FOR CONTINUOUSLY PRODUCING TANDEM AMORPHOUS PHOTOVOLTAIC CELLS

Herbert C. Ovshinsky, Oak Park, and Masatsugu Izu, Birmingham, both of Mich., assignors to Sovonics Solar Systems, Solon, Ohio

Filed Mar. 19, 1982, Ser. No. 359,825
Int. Cl.³ C23C *13/10*
U.S. Cl. 118—718 **21 Claims**

1. A multiple chamber deposition apparatus for continuously producing tandem, amorphous, photovoltaic cells; each cell having a total cell thickness of at least two tri-layered units, each unit including one p-type layer and one n-type layer operatively disposed on opposite sides of an intermediate intrinsic layer; said apparatus comprising, in combination:

substrate material;

a pay-off chamber including a pay-off mandril;

a substrate cleaning chamber;

sources of cleaning gases;

means for introducing the cleaning gases into the cleaning chamber for cleaning the substrate;

a triad of deposition chambers for each tri-layered unit of the tandem cells; the deposition chambers arranged sequentially for the deposition of the p-type and n-type layers at the ends of each triad sequence and for the deposition of the intrinsic layer between the p-type and n-type layers of each triad sequence to provide three deposition layers for each cell unit;

a take-up chamber including a take-up mandril;

a source of interleaf sheeting for positioning between adjacent layers of substrate material as the substrate material is wound about the take-up mandril;

means for vacuumizing the apparatus;

means for heating the deposition chambers and the substrate;

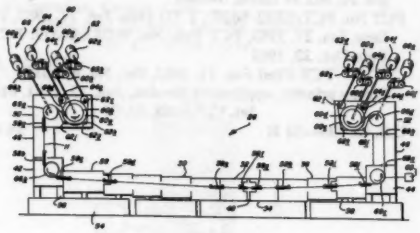
automatic threading means adapted to deliver the leading edge of the substrate material from the pay-off mandril to the take-up mandril;

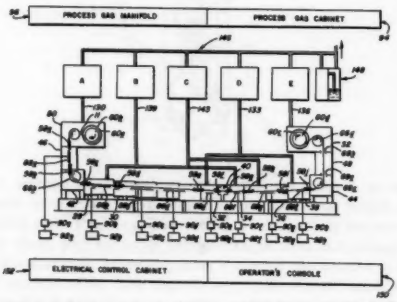
means for continuously moving the substrate material from the pay-off mandril through the cleaning chamber and each triad of deposition chambers to the take-up mandril;

means for depositing the successive layers of the tri-layered units upon the substrate material or previously deposited layers;

sources of reaction gases which include semiconductor precursor gases and dopant precursor gases;

means operatively associated with each chamber of each triad of deposition chambers for introducing a preselected reaction gas mixture thereinto;





a gas gate operatively disposed between each pair of deposition chambers of the triads;

a source of sweep gas for the gas gates;

means adapted to introduce sweep gas into the gas gates for substantially isolating the reaction gas mixture in the second chamber of each triad of chambers from the reaction gas mixtures in the first and third chambers of said triad of chambers;

a discrete isolation chamber disposed between the third chamber of one triad of chambers and the first chamber of the succeeding triad of chambers;

sources of isolation gases;

means for introducing an isolation gas mixture into said isolation chamber, means associated with said isolation chamber for providing a unidirectional flow of gas therefrom into said third chamber of one triad and said first chamber of the succeeding triad, so as to substantially prevent cross contamination of the respective gas mixtures therein; and,

means for substantially maintaining the preset substrate

temperature, speed of substrate travel, substrate tension, mixtures of reaction gases in each deposition chamber, mixtures of isolation gases in the isolation chamber, sweep gas in the gas gates, pressure differentials between adjacent chambers, and vacuum pressures; whereby, high quality tandem photovoltaic cells are continuously produced on the substrate material.

4,492,182

METHOD AND DEVICE FOR FEEDING ANIMALS

Gunnar Wensman, and Britta Wensman, both of Myrmalmsvägen 56, 802 38 Gävle, Sweden

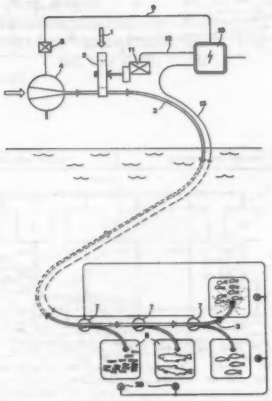
PCT No. PCT/SE82/00207, § 371 Date Jan. 27, 1983, § 102(e) Date Jan. 27, 1983, PCT Pub. No. WO82/04379, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 11, 1982, Ser. No. 464,512

Claims priority, application Sweden, Jun. 12, 1981, 8103690

Int. Cl.³ A01K *61/02*

U.S. Cl. 119—51 R **14 Claims**



3. A device for feeding animals, particularly fish, comprising a conduit leading to a feed location, a member for supplying food into said conduit and a pressurized fluid source to provide a flow of fluid through said conduit for transport of said food, said food supply member comprising a rotor having food cells adapted to be successively filled with individual food charges and brought into communication with said conduit for successively discharging said individual charges into said conduit, said rotor being located in a housing having inlet and outlet openings, said inlet opening communicating with a conduit portion located upstream of said housing and said outlet opening communicating with a conduit portion located downstream of said housing, said inlet and outlet openings of said housing being further disposed so as to have between them a portion of said rotor and being adapted to cause said flow of fluid generated by said pressurized fluid source to flow into and through said cells of said rotor from one end of said cells to the other end thereof as said cells are successively rotated proximate to said inlet opening so as to positively evacuate said food charges from said cells and transfer said food charges from said cells into said conduit through the outlet opening.

4,492,183

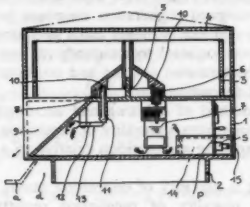
AUTOMATIC DISTRIBUTOR-FEEDER WITH PLURAL COMPARTMENTS FOR GRANULAR FOOD FOR DOMESTIC ANIMALS

Pierre Chiotasso, and Jacques Dostes, both of Nice, France, assignors to Societe Spart, Nice, France

Filed Dec. 20, 1982, Ser. No. 451,239

Int. Cl.³ A01K *5/02*

U.S. Cl. 119—51.13 **2 Claims**



1. Automatic distributor-feeder for various foods comprising a reservoir (3) with plural recesses c adapted to be moved by a motor (7) actuated by a programmer, characterized by the fact that the motor is fed by batteries and consumes power only instantaneously and by virtue of the use of an electric programmer, said motor (7) driving, by a pinion (6), a central toothed wheel (8) coaxial with the reservoir (3), said toothed wheel being integral with the base of the center of the reservoir (3), and automatic aligning means (10 and 11) which permit the reservoir (3) always to stop with one of the recesses c above a hopper (9) into which the food falls from the recesses c, said aligning means comprising a pusher (11) which is disposed at the level of a support body (1) and which registers with cams in the form of inclined ramps (10) provided at the level of the toothed wheel (8) and whose arrangement permits the pusher to actuate the motor (7) so as to bring the recess c into registry with said hopper (9).

4,492,184

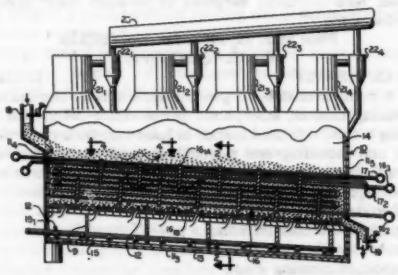
SOLIDS COOLING

James P. Norton, Elmwood Park, and Lawrence P. Golan, Randolph, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Oct. 13, 1983, Ser. No. 541,530

Int. Cl.³ F22B *1/02*; F23G *7/00*

U.S. Cl. 122—4 D **9 Claims**



1. In apparatus for cooling hot particulate solids of a wide range of particle size distribution, and recovering heat therefrom principally by contact of the hot particulate solids with a tube type heat exchanger through which a coolant is passed, which comprises

an elongate housing having enclosing end and side walls, the lower ends of the side walls of which slope inwardly, inclusive of a floor and a sloped distributor plate declined from horizontal at an angle, with jet openings there-

through directed downwardly in the direction of the slope and declined from the vertical at an angle between about 0° to 45°, located above the floor which partitions the housing into two compartments, an upper compartment the lower side of which is of reduced cross-section as compared with its upper side as produced by said inwardly sloped side walls, within which can be provided a bed of solids, and a lower plenum, inclusive of

a gas manifold located within the plenum, inclusive of gas inlet means for injection of gas into the manifold for release through the jet openings of the distributor plate for contact and expansion of the bed of solids, at velocities insufficient to fluidize a significant portion of the solids to maximize heat transfer between the tube type heat exchanger and the solids, and assist in the movement of the solids along the surface of the distributor plate,

a hot particulate solids inlet for the delivery of hot particulate solids to the bed of particulate solids within said upper compartment,

an elongate tube type heat exchanger inclusive of a bundle of tubes held together via a series of tube sheets which extend from one side wall to the other side wall, and are alternately vertically staggered one with regard to another to reduce the amount of backmixing of the solids, a plurality of said, tubes oriented generally parallel to the major solids velocity component of solids movement, located within the upper compartment and immersed within the bed of particulate solids, through which the field coolant can be passed in heat exchange relationship with the solids, and

a cool solids outlet located at the level of the distributor plate through which cooled solids can be discharged after passage of hot particulate solids from the hot solids inlet into the bed which moves downwardly along the sloped surface of the distributor plate, through the length of the upper compartment contacting the tubes of the heat exchanger to effect heat exchange between the hot particulate solids and the fluid coolant passed through the tubes of the heat exchanger, sufficient to recover a principle amount of the heat from the solids, cooled solids being discharged through the cool solids outlet.

4,492,185

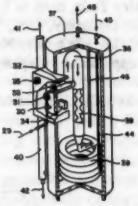
HIGH EFFICIENCY, REDUCED EMISSIONS WATER HEATER

Robert M. Kendall, Sunnyvale; Richard J. Schreiber, Mountain View, and John P. Kesselring, Mt. View, all of Calif., assignors to Alzeta Corporation, Mt. View, Calif.

Continuation of Ser. No. 308,374, Oct. 5, 1981, abandoned. This application Jan. 20, 1984, Ser. No. 572,602

Int. Cl.³ F22B 1/02

U.S. Cl. 122—32 **3 Claims**



1. A water heater comprising a water storage chamber; combustion heating means comprising an infrared fiber matrix burner positioned in the upper portion of the interior of said chamber; heat exchanging means positioned below said combustion heating means within said chamber accommodating a first conduit for flue gas from said combustion heating means whereby said heat exchanging means provides heat to water in said chamber and lowers the temperature of said flue gas to about 300° F.; condensing heat exchanging means positioned below said heat exchanging means within said chamber accommodating a second conduit for said flue gas, said second conduit communicating with said first conduit, whereby contact of said condensing heat exchanging means with water at substantially ambient or lower than ambient air temperature from a source of water external to said chamber lowers the temperature of said flue gas below the dew point whereby moisture formed as a by-product of combustion condenses in said condensing heat exchanging means; and whereby water entering said chamber at substantially ambient or less than ambient temperature is heated by said combustion heating means, heat exchanging means and condensing heat exchanging means to provide stratified zones of heated water within said chamber, said heater characterized by a steady state thermal recovery efficiency from said combustion heating means and both said heat exchanging means to the water within said chamber in the range of 90–95%, and further characterized by NO_x emission concentration of flue gas exiting said condensing heat exchanging means of less than about 15 ppm.

4,492,186

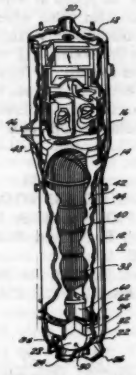
STEAM GENERATOR SLUDGE REMOVAL METHOD

John L. Helm, Groton, Conn., assignor to Proto-Power Management Corporation, Groton, Conn.

Filed Aug. 23, 1982, Ser. No. 410,562

Int. Cl.³ F22B 37/54

U.S. Cl. 122—382 **14 Claims**



1. A method of removing sludge deposits from a steam generator in which primary heating fluid tubes rise within a peripheral wall of said generator from a substantially horizontal tube sheet, with the tubes being arranged to define passageways therebetween extending from a medial end thereof at a medial portion of the tube sheet to a peripheral end thereof at an edge of said tube sheet, and with a peripheral channel being defined between outermost tubes on said tube sheet and said peripheral wall; comprising:

inserting a fluid jet lance through a port in said peripheral wall near said tube sheet at said medial portion thereof to direct a jet of fluid along one of said passageways between said tubes;

positioning a fluid suction conduit through a port in said peripheral wall into said peripheral channel so that a suction opening of said fluid suction conduit is aligned at the peripheral end of the one passageway along which the jet of fluid is directed;

supplying fluid to said fluid jet lance to form said jet of fluid, and dislodge and entrain sludge on said tube sheet in said jet of fluid, so that the jet of fluid and the entrained sludge flow toward the suction opening of said fluid suction conduit at said peripheral end of said one passageway; and

applying sufficient suction to said fluid suction conduit to suck up the fluid and entrained sludge at the peripheral end of said one passageway.

4,492,187
SOOTBLOWER APPARATUS

Charles W. Hammond, Lancaster, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 5, 1983, Ser. No. 558,380
Int. Cl.³ F22B 37/52
U.S. Cl. 122—390 8 Claims

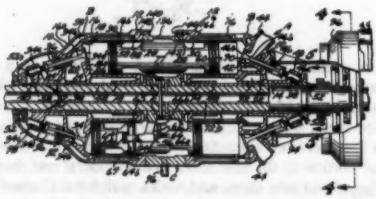
1. In a sootblower apparatus of the type having a lance tube and drive means for translating said lance tube into and out of a boiler or the like and simultaneously rotating the lance tube, wherein the unsupported length of said lance tube varies during its inward and outward movement, and means for supplying a blowing agent to an outer end of said lance tube, the improvement comprising:

variable speed modulation controller means for the drive means such that the speed at which the lance tube is rotated is at a maximum value when the lance tube is in a position intermediate its fully extended and fully retracted positions within the boiler, and reduces gradually as the lance tube moves toward the fully extended position, the rate of rotation being at all times below the critical speed at which resonance occurs, thereby optimizing the cycle time of the sootblower apparatus.

4,492,188
INTERNAL COMBUSTION ENGINE

Dennis C. Palmer, P.O. Box 8009, Fountain Valley, Calif. 92708, and Edward B. Palmer, 3520 E. Janice St., Long Beach, Calif. 90805

Filed Jan. 21, 1983, Ser. No. 459,765
Int. Cl.³ F02B 25/28
U.S. Cl. 123—58 R 1 Claim



1. In an internal combustion engine that includes an elongate drive shaft having first and second end portions, a force receiving cam that has first and second oppositely disposed sinusoidal edge surfaces, a plurality of pistons that have first and second ends, a plurality of pair of cam followers mounted on said pistons that are at all times in moving contact with said first and second edge surfaces and that impart rotary motion to said cam and drive shaft when reciprocated relative thereof, an improved block assembly for rotatably supporting said drive shaft, said improved block assembly including:

a. a circular connector shell within which said cam is disposed;

b. forward and rearward identical engine blocks that have adjacent ring shaped surfaces in abutting contact with said connector shell and when so disposed defines a plurality of axially aligned forward and rearward cylinders in which portions of said pistons are at all times slidably disposed;

c. forward and rearward axially aligned tubular bearing in said forward and rearward engine blocks that rotatably support said drive shaft, said drive shaft having an elongate passage and at least one transverse passage in communication therewith;

d. first and second circumferentially extending confined spaces defined in each of said engine blocks, each of said first confined spaces in communication with a plurality of first fuel inlet valve seats that communicate with said cylinders, and each of said first confined space in communication with oppositely disposed fuel inlets through which fuel may be concurrently discharged to assure that said engine will not suffer from fuel starvation, and each of said second confined spaces having oppositely disposed coolant supply inlets through which coolant may be concurrently discharged to cool said engine block and then discharge therefrom, and a plurality of exhaust valve seats in each of said engine blocks in communication with said cylinders;

e. a plurality of spring loaded fuel inlet and exhaust valves in said forward and rearward engine blocks that are movably supported and at all times tend to sealingly engage said fuel inlet and exhaust valve seats;

f. first and second sets of spark plugs in said forward and rearward engine blocks;

g. first and second electrical means including a distributor driven by said drive shaft for supplying high voltage current to said spark plugs to sequentially ignite fuel charges in said cylinders adjacent first ends of said pistons and then fuel charges in said cylinders adjacent second ends of said pistons;

h. first and second cam means mounted on said drive shaft that actuate said fuel inlet and exhaust valves on each of said cylinders to sequentially open and close to admit fuel into and exhaust from said cylinders as said pistons reciprocate relative to said forward and rearward engine blocks;

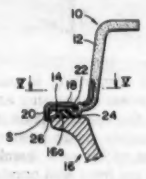
i. bolt means for removably holding said forward and rearward engine blocks in abutting contact with said connector shell, with said connector shell having a transverse opening therein through which a lubricant may flow by gravity when said engine is in a horizontal position; and

j. first means for forcing lubricant under pressure into said elongate and transverse passages to flow therefrom to lubricate said cam, cam followers and said drive shaft in said forward and rearward tubular bearings, and said lubricant discharging through said transverse openings after flowing into an interior confined space defined by said connector shell.

4,492,189
ROCKER COVER ASSEMBLY

Naoki Ogawa, and Akira Toda, both of Yokosuka, Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Jul. 15, 1982, Ser. No. 398,708
Claims priority, application Japan, Jul. 16, 1981, 56-105539[U]
Int. Cl.³ F01L 1/46
U.S. Cl. 123—90.38 10 Claims



1. A rocker cover assembly for covering a cylinder head, comprising:

a rocker cover body made of a material having damping capacity and including an installation flange section at which said rocker cover body is mounted on the cylinder head, said installation flange section having a plurality of projections each of which projects toward the cylinder head;

a rigid frame-like pressure-plate disposed in contact with the rocker cover body installation flange section and including an outer bent section to cover the outer periphery of said installation flange section, and a plurality of inner bent portions each of which is plunged into said installation flange section at a location where a projection of said rocker cover body installation flange section is formed, said pressure plate being higher in rigidity than said rocker cover body; and

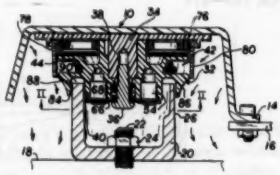
a seal-ring interposed between the cylinder head and said rocker cover body installation flange section and located within a space defined between said pressure-plate outer bent section and the projections of said rocker cover body installation flange section.

4,492,190

RECOIL STARTER

Leon D. Greenwood, Okemos, and Thomas A. Thorsen, Eaton Rapids, both of Mich., assignors to Eaton Stamping Company, Eaton Rapids, Mich.

Filed Apr. 20, 1983, Ser. No. 486,709
Int. Cl.³ F02N *1/00*
U.S. Cl. 123—185 A **10 Claims**



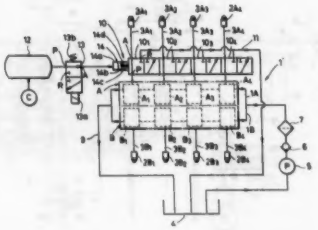
1. A recoil starter for internal combustion engines wherein the starter comprises a supporting housing, a pulley mounted upon the housing rotatable in cranking and rewind directions about an axis and having a rope receiving groove defined therein, a rope within the pulley groove, a recoil spring interposed between the housing and pulley biasing the pulley in the rewind direction, a dog movably mounted upon the pulley movable between a retracted position and an extended position and a dog operator mounted adjacent the pulley rotatable about the pulley axis operatively connected to the dog having a first rotative position relative to the pulley moving the dog to the extended position upon the pulley rotating in the cranking direction and having a second rotative position relative to the pulley moving the dog to the retracted position upon the pulley rotating in the rewind direction, the improvement comprising, spring operated displaceable detent means interposed between the pulley and dog operator maintaining the dog operator in its second position, said detent means being overcome upon the pulley being rotated by the rope in the cranking direction.

4,492,191

FUEL CUT-OFF DEVICE FOR FUEL INJECTION PUMPS FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINES

Fujio Aoki, and Hiroshi Isobe, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Saitama, Japan

Filed Feb. 22, 1983, Ser. No. 468,397
Claims priority, application Japan, Mar. 2, 1982, 57-29168[U]
Int. Cl.³ F02D *17/02*
U.S. Cl. 123—198 F **5 Claims**



1. In a fuel injection pump for an internal combustion engine having a plurality of cylinders, said fuel injection pump including a feed pump, at least one injection pump body connected to said feed pump, a plurality of injection nozzles mounted in said engine, and a plurality of injection pipes connected between said injection pump body and said injection nozzles, each of said injection pipes extending between said injection pump body and a corresponding one of said injection nozzle and supplying fuel pumped from injection pump body to said corresponding one injection nozzle, a fuel cut-off device comprising: at least one three way valve arranged across one of said injection pipes connected to one of said injection nozzles associated with at least preselected one of said cylinders of said engine; return fuel line means extending from said three way valve to a lower pressure zone; said three way valve being disposed to connect said injection pump body to said one injection pipe when it is in a first valve position thereof, and to connect said injection pump body to said return fuel line means when it is in a second valve position thereof; and operating means for changing the valve position of said three way valve; whereby when said three way valve is changed to said first valve position, fuel pumped from said injection pump body is immediately delivered to said one injection nozzle through said three way valve and said one injection pipe and injected into the engine, and when said three way valve is changed to said second valve position, said delivery of said pumped fuel to said one injection nozzle is immediately interrupted to interrupt said injection of said pumped fuel to the engine and simultaneously said pumped fuel is returned to said lower pressure zone through said return fuel line means.

4,492,192

DIESEL PISTON ENGINE

Yves Baguelin, Rhone, France, assignor to Renault Vehicules Industriels, France

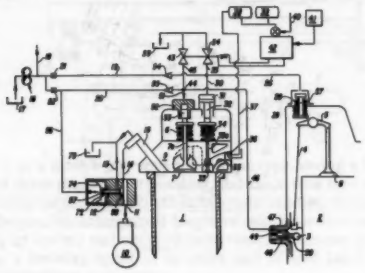
Filed Jul. 29, 1983, Ser. No. 518,434
Int. Cl.³ F02D *13/04, 17/02*
U.S. Cl. 123—198 F **20 Claims**

1. In a diesel piston engine, comprising a plurality of cylinders, a cylinder head for each of said plurality of cylinders, intake valve means and exhaust valve means for each of said plurality of cylinders, a fuel oil injector for each of said plurality of cylinders, control means selectively operable to enable and disable said fuel oil injectors, and timing means for regulating the cycle of operation of said plurality of cylinders, said intake valve means, said exhaust valve means and said fuel oil injectors, the improvement wherein a preselected cylinder of said plurality of cylinders further comprises:

passage means in said cylinder head of said preselected cylinder having one end opening into said preselected cylinder;

extra valve means along said passage means for selectively opening and closing said passage means;

hydraulic means for controlling the sequential opening and closing of said extra valve means in synchronism with the cycle of the other cylinders of said plurality of cylinders; and



switching means selectively operable to disconnect and connect said hydraulic means and to enable and disable said fuel oil injector such that said switching means disconnects said hydraulic means and enables said fuel oil injector to operate said preselected cylinder as an engine cylinder and further such that said switching means connects said hydraulic means and disables said fuel oil injector to operate said preselected cylinder as a compressor cylinder.

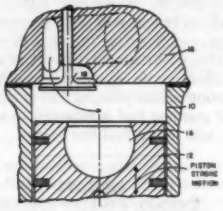
4,492,193
METHOD OF OPERATING INTERNAL COMBUSTION ENGINES

Alfred Neitz, Röthenbach, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 79,156, Sep. 26, 1979, abandoned. This application Jul. 8, 1981, Ser. No. 281,517

Int. Cl.³ F02B 3/04

U.S. Cl. 123—276 8 Claims



1. A method of operating air-compressing direct-injecting internal combustion engines having at least one piston, a cylinder having a cylinder head, a combustion chamber including a wall formed in said at least one piston, means for introducing air, said combustion chamber in said at least one piston having a cylindrical shape with a longitudinal central axis and being adapted to accommodate movement of air about its longitudinal central axis, injector means for introducing fuel in the direction of movement of air in said combustion chamber and depositing fuel partially as a film on the wall of said combustion chamber in said piston during at least one of the conditions consisting of the group of upper speed range and upper load range, while during idling of said combustion engine and during at least one of the conditions consisting of lower speed range and lower load range, a direct mixing of combustion air and fuel occurs, said injector means having an outlet and means adjustable therewith so that effective cross sectional area of the outlet is selectively controllable, said method comprising in combination the steps of:

introducing combustion air into said combustion chamber to rotate about said longitudinal axis at a predetermined velocity;

injecting a fuel stream at a predetermined velocity into said combustion chamber so that a hollow fuel stream with differing inner diameters of the fuel stream for predetermined surface area of the fuel stream leaving the injector means with varying of inner diameter thereof, has a velocity equal to the combustion air velocity when the engine is operating at its rated speed;

reducing the velocity of the combustion air by varying inner diameter of the fuel stream in proportion to a decrease of speed of said internal combustion engine and at a constant velocity of introduction of said fuel stream, to provide a velocity difference between the fuel velocity and the air velocity; and

selectively controlling the surface area of the fuel stream leaving the injector means by varying inner diameter of the fuel stream as an inverse function of a speed air said internal combustion engine so that upon increasing the speed thereof the surface area is decreased.

4,492,194
SPARK-IGNITION AIR-COMPRESSING INTERNAL COMBUSTION ENGINE

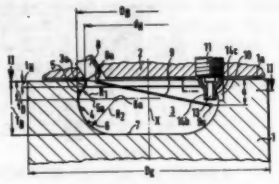
Franz Chmela, Nuremberg; Walter Herzog, Katzwang, and Richard Meier, Stein, all of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik, Nuremberg, Fed. Rep. of Germany

Filed Dec. 12, 1983, Ser. No. 560,154

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1982, 3245780

Int. Cl.³ F02B 3/00

U.S. Cl. 123—276 14 Claims



1. Spark-ignition, air-compressing internal combustion engine, comprising: a cylinder head on the engine, an ignition device on the cylinder head; a piston movable in the engine toward the cylinder head; a combustion chamber in the piston; injection nozzle means for direct injection of fuel by a jet applying the major portion of the fuel onto the wall of the combustion chamber, the wall being in the shape of a solid of revolution; means for imparting such a rotary motion in the direction of the injected fuel jet to air flowing into the combustion chamber that the fuel is gradually removed in a vapor state from the combustion chamber wall and mixed with the air, the injection nozzle means being situated in the cylinder head near the edge of the combustion chamber and the ignition device being arranged opposite the injection nozzle and projecting into the combustion chamber in the top, dead-center position of the movement of the piston toward the cylinder head, the side wall (4) of the combustion chamber (3)—seen in cross section—being formed by two curved lines (5, 6) which blend into each other, a first (5) of the curved lines having the smaller radius of curvature (R_1) and extending from a constricted

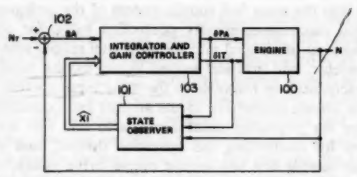
combustion chamber opening (3*a*) down to the maximum combustion chamber diameter (D_B) and the second curved line (6) having the greater radius of curvature (R_2) and extending down to and blending into a substantially-flat combustion chamber bottom (7), the maximum combustion chamber diameter (D_B) amounting to 0.5 to 0.7 times the piston diameter (D_K) and—measuring from the piston crown (1*a*)—located at a depth (t_D) which corresponds to 0.3 to 0.4 times the combustion chamber depth (T_B), and the smaller radius of curvature (R_1) of the combustion chamber side wall (4) having a length of 0.2 to 0.3 T_B, the greater radius of curvature (R_2) having a length of 0.5 to 0.75 T_B, the ratio of the combustion chamber opening diameter (d_H) to the maximum combustion chamber diameter (T_B) being between 0.85 and 0.95 and the wall height (t_H) of the combustion chamber opening (3*a*) being between 0.1 and 0.15 T_B.

4,492,195

METHOD OF FEEDBACK CONTROLLING ENGINE IDLE SPEED

Toru Takahashi, and Takashi Ueno, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Sep. 15, 1983, Ser. No. 532,555
Claims priority, application Japan, Sep. 16, 1982, 57-159533
Int. Cl.³ F02M *3/00, 23/06*
U.S. Cl. 123—339 **19 Claims**



1. A method of feedback controlling engine idle speed to a target speed on the basis of mathematical dynamic models to determine engine state variables representative of engine dynamic behavior, which comprises the following step of:

(a) calculating the differences SA between the target engine idle speed N_r and current engine speeds N;

(b) integrating the calculated idle speed differences SA to obtain integral value DUN of speed differences;

(c) selecting an appropriate mathematical engine dynamic model according to at least one of predetermined engine operating conditions;

(d) estimating low-order variables x_i representative of engine internal dynamic states in accordance with the selected dynamic model and on the basis of at least one or two or more combinations of preceding increments of engine idle speed controlling parameters δP_A, δIT and controlled engine idle speed δN;

(e) selecting an appropriate gain K according to external engine load conditions; and

(f) determining increments of engine idle speed controlling parameters δP_A, δIT on the basis of the estimated state variables $\hat{x}_i$, the selected gain K, and the integrated idle speed difference DUN,

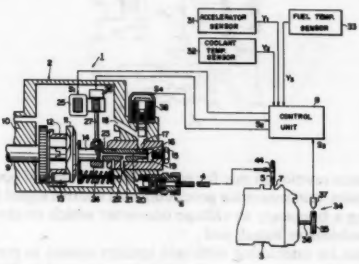
whereby engine idle speed is feedback controlled in accordance with low-order engine dynamic state variables.

4,492,196

ELECTRONICALLY CONTROLLED FUEL INJECTION APPARATUS

Hidekazu Oshizawa, Kumagaya, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1981, Ser. No. 296,766
Claims priority, application Japan, Sep. 11, 1980, 55-128528
Int. Cl.³ F02M *39/00*; F02B *25/08*
U.S. Cl. 123—357 **8 Claims**



1. An electronically controlled fuel injection apparatus for an internal combustion engine, comprising:

means for actuating a member for adjusting the amount of fuel injection;

a position sensor for producing a first signal indicating the position of said member;

at least one condition sensor for generating condition data indicating the operating condition of said engine;

a circuit for generating a first target signal indicating the position of said adjusting member necessary for injecting the optimum amount of fuel based on said condition data;

a circuit for generating a first control signal in accordance with the difference between said first target signal and said first signal;

a first detector for detecting the occurrence of trouble in said position sensor;

a circuit for producing a second target signal in accordance with the operating quantity of an accelerator pedal, said second target signal being indicative of an engine speed decided in advance in correspondence to said operating quantity of an accelerator pedal;

means for generating a second signal indicative of the rotational speed of the engine;

a circuit for producing a second control signal in accordance with the difference between said second target signal and said second signal; and

a switching means for selectively providing either of said first and said second control signals to said actuating means in response to the result of detecting operation of said first detector in such a way that said actuating means is controlled in accordance with said first control signal for the normal condition of said position sensor and is controlled in accordance with said second control signal for the abnormal condition of said position sensor.

4,492,197

OVER-REVOLUTION PREVENTING APPARATUS FOR INTERNAL COMBUSTION ENGINES

Yasuo Yamamoto, Hamamatsu, and Isao Kaano, Shizuoka, both of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Oct. 3, 1983, Ser. No. 538,097
Claims priority, application Japan, Oct. 4, 1982, 57-172153
Int. Cl.³ F02N *15/10*; F02P *1/00*; F02D *33/00*
U.S. Cl. 123—630 **19 Claims**

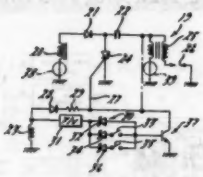
1. In an internal combustion engine which is capable of operating in a plurality of selectable operation states and has an

ignition system, a revolution rate limiting apparatus, comprising:

means for generating a tachometer signal indicative of the revolution rate of said internal combustion engine;

means for producing a control signal which is responsive to said tachometer signal and the operation state of said internal combustion engine, and which determines a maximum revolution rate for each of said plurality of operation states, said means for producing said control signal including a frequency to voltage converter which receives said tachometer signal; and

means for interacting with said ignition system to prevent a sparking voltage from being induced in said ignition system in response to the value of said control signal.



4,492,198

ADVANCING MECHANISM FOR INTERNAL COMBUSTION ENGINES

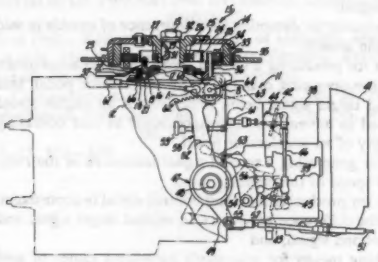
Shigeo Okumura, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha and Sanshin Kogyo Kabushiki Kaisha, both of, Japan

Continuation of Ser. No. 347,583, Feb. 10, 1982, abandoned. This application Feb. 27, 1984, Ser. No. 583,272

Claims priority, application Japan, Mar. 10, 1981, 56-34141

Int. Cl.³ F02P 5/02

U.S. Cl. 123—413 **9 Claims**



1. In a timing mechanism for an internal combustion engine comprising means for initiating ignition, timing means for altering the timing of said ignition by means of a movable element, a throttle valve, an operating member mechanically connected to said throttle valve for positioning said throttle valve, and means for interrelating the operation of said timing means with the position of said throttle valve, the improvement comprising said interrelating means including means providing a mechanical connection between said operating member and said movable element being effective to move said movable element in a direction to advance the ignition timing from a predetermined position as said throttle valve is opened to a predetermined maximum advance and thereafter moving said movable element in a direction to retard the ignition timing from said maximum advance upon continued opening of said throttle valve to a fixed advance intermediate of said maximum advance and said predetermined position at an opening of said throttle valve less than its wide-open position and permit continued movement of said operating member without further movement of said movable element to retain said fixed advance during continued opening of said throttle valve until wide-open throttle position is reached.

4,492,199

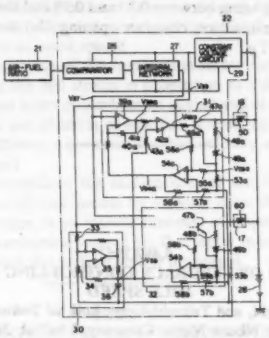
AIR-FUEL RATIO COMPENSATING APPARATUS FOR INTERNAL COMBUSTION ENGINE

Yukio Kawai, Toyota; Toshihisa Ogawa, Aichi, and Seietsu Yoshida, Kariya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 14, 1982, Ser. No. 417,853

Int. Cl.³ F02M 7/24

U.S. Cl. 123—440 **4 Claims**



1. An air-fuel ratio compensating apparatus for the carburetor of an internal combustion engine comprising a first electromagnetically controlled valve for controlling the amount of air bled into the main fuel supply system of the carburetor and a second electromagnetically controlled valve for controlling the amount of air bled into the slow fuel supply system of the carburetor, said first and second valves having equal opening characteristics in response to the same input current, an electronic circuit responsive to the air-fuel ratio condition of the engine for providing input currents to said first and second valves for controlling the operation thereof, said electronic circuit having first and second output drive means connected respectively to said first and second valves for providing an input current to said second valve which is always larger than the input current applied to said first valve such that the second valve is opened a greater amount than the first valve in response to a deviation of the air-fuel ratio condition of the engine.

4,492,200

FUEL PUMPING APPARATUS

Ikuo Takahashi, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,446

Claims priority, application Japan, May 14, 1982, 57-79858

Int. Cl.³ F02M 41/06

U.S. Cl. 123—450 **6 Claims**

1. A fuel pump for an internal combustion engine, the fuel pump comprising:

a main body having a bore therein;

a rotor housed within said bore and adapted to be rotated in synchronism with a rotation of said engine;

a working chamber formed in said rotor;

a shuttle member disposed slidably within said working chamber to divide said working chamber into a first and second working chamber section;

a pumping means having a pumping chamber, a volume of said pumping chamber being varied in accordance with a rotation of the engine;

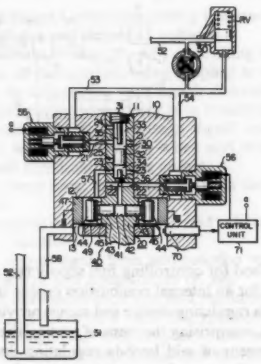
a first fuel passage in which a first metering means is disposed for metering a pressurized fuel to be delivered into said first working chamber section through said first fuel passage;

a second fuel passage in which a second fuel metering means is disposed for metering a pressurized fuel to be delivered to said second working chamber section through said second fuel passage;

a third fuel passage adapted to communicate said second working chamber section with an atmosphere;

a fourth fuel passage adapted to communicate said first working chamber section with an injection nozzle; and

a fifth fuel passage adapted to communicate said pumping chamber with said second working chamber section;



wherein, when the pressurized fuel is delivered into said first working chamber section through said first fuel passage, said second working chamber is communicated with the atmosphere through said third fuel passage as well as the pressurized fuel is delivered into said pumping chamber through said second fuel passage, and, when said first working chamber section is communicated with said injection nozzle through said fourth fuel passage, the pressurized fuel delivery into said first working chamber section through said first fuel passage is interrupted, and the communication between the second working chamber section and the atmosphere is also interrupted and said second working chamber is communicated with said pumping chamber.

4,492,201

PETROL INJECTOR PROTECTION SHEATH

Dario Radaelli, Legnano, Italy, assignor to Alfa Romeo Auto S.p.A., Naples, Italy

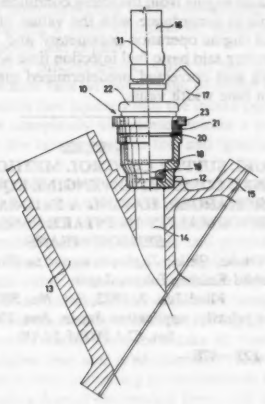
Filed May 5, 1983, Ser. No. 491,704

Claims priority, application Italy, May 17, 1982, 21314 A/82

Int. Cl.³ F02M *55/00, 61/14, 55/02*

U.S. Cl. 123—470 **9 Claims**

1. A fuel injector of the type having a fitting for attachment to a fuel supply line, an electrical control, a body and a lower nozzle, said fuel injector being improved by heat shielding means including a thick wall heat insulating cup-shaped sheath telescoped entirely over said nozzle and surrounding said body, said sheath including a bottom wall having a hole therethrough for the injection of fuel, a lower part of said sheath including an outer portion of said bottom wall forming combined seating and sealing means for the mounting of said fuel injector within a seat of an engine intake duct.



4,492,202

FUEL INJECTION CONTROL

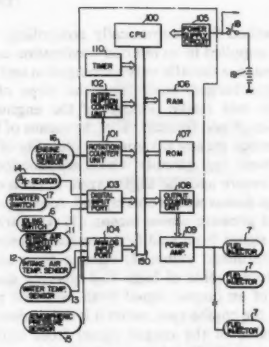
Toshihiko Muramatsu; Akio Kobayashi; Toshio Kondo; Shigenori Isomura, and Tomomi Eino, all of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 25, 1983, Ser. No. 460,856

Claims priority, application Japan, Jan. 29, 1982, 57-13133

Int. Cl.³ F02B *3/00, 3/04*

U.S. Cl. 123—478 **3 Claims**



1. A fuel injection control method for an internal combustion engine having electromagnetic fuel injectors to control an air-fuel ratio of said engine at a desired air-fuel ratio, said method comprising the steps of:

detecting conditions of operation parameters of said engine by respective sensors;

determining a basic fuel injection time width of a fuel injection pulse signal applied to said electromagnetic fuel injectors in accordance with the detected conditions of said engine operation parameters;

storing maximum fuel injection time width values predetermined in correspondence to values of a predetermined one of said engine operation parameters;

reading one of said predetermined maximum fuel injection

time width values, corresponding to the values of said predetermined one of said engine operation parameters, after a predetermined time elapses from the acceleration of said engine from the idling condition and correcting the same in accordance with the values of the other ones of said engine operation parameters; and

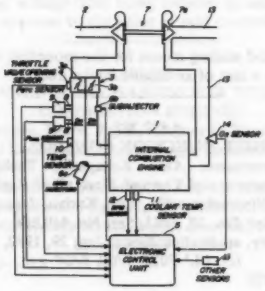
correcting said basic fuel injection time width in accordance with said corrected predetermined maximum fuel injection time width value.

4,492,203

FUEL SUPPLY CONTROL METHOD FOR AN INTERNAL COMBUSTION ENGINE EQUIPPED WITH A SUPERCHARGER, HAVING A FAIL-SAFE FUNCTION FOR ABNORMALITY IN INTAKE PASSAGE PRESSURE SENSOR MEANS

Yutaka Otobe, Shiki, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1983, Ser. No. 500,300
Claims priority, application Japan, Jun. 10, 1982, 57-99758
Int. Cl.³ F02M 51/00
U.S. Cl. 123—478 3 Claims



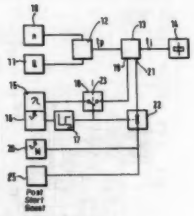
1. A method for electronically controlling the quantity of fuel being supplied to an internal combustion engine having an intake passage, a throttle valve arranged in said intake passage, and a supercharger, comprising the steps of: (1) detecting pressure in said intake passage of the engine at a location downstream of said throttle valve, by means of first and second pressure sensor means; (2) storing a plurality of predetermined values of basic fuel quantity which are functions of the intake passage pressure and the engine rpm, in each of first and second storage means which correspond, respectively, to said first and second pressure sensor means; (3) comparing the value of an output signal from said first pressure sensor means with a first predetermined value; (4) reading from said first storage means a stored value of basic fuel quantity corresponding to the value of an output signal from said first pressure sensor means and the engine rpm, when it is determined in the step (3) that the value of the output signal from said first pressure sensor means is smaller than said first predetermined value; (5) reading from said second storage means a stored value of basic fuel quantity corresponding to the value of an output signal from said second pressure sensor means and the engine rpm, when it is determined in the step (3) that the value of the output signal from said first pressure sensor means is larger than said first predetermined value; (6) supplying a quantity of fuel corresponding to the stored value read in the step (4) or (5) to the engine; (7) comparing the value of an output signal from said second pressure sensor means with a second predetermined value which is smaller than said first predetermined value; and (8) supplying a predetermined quantity of fuel to the engine when it is determined in the step (3) that the value of the output signal from said first pressure sensor means is larger than said first predetermined value, and at the same time it is determined in the step (7) that the value of the output signal from said second pressure sensor means is smaller than said second predetermined value.

4,492,204

METERING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Richard Bertsch, Asperg; Dieter Günther, Murr, and Ulrich Steinbrenner, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,228
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1982, 3207787
Int. Cl.³ F02D 5/00
U.S. Cl. 123—489 6 Claims



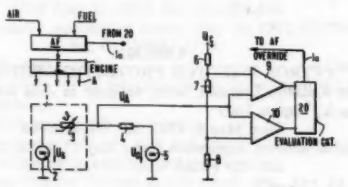
1. A method for controlling fuel supply rate in a fuel metering system for an internal combustion engine having a closed-loop lambda regulating device and means providing a warm-up enrichment, comprising the steps of sensing the temperature of a lambda sensor of said lambda regulating device, switching from an open-loop regulation to closed-loop lambda regulation of fuel supply in response to said sensing step, reducing the amount of warm-up enrichment when said closed-loop regulation begins, switching from said closed-loop regulation to said open-loop regulation in response to sensing of a predetermined temperature range in said sensing step, and preventing the amount of warm-up enrichment from being increased following a return from closed-loop lambda regulation to open-loop regulation.

4,492,205

METHOD OF CONTROLLING THE AIR-FUEL RATIO IN AN INTERNAL COMBUSTION ENGINE

Werner Jundt, Belschnerstrasse 24, D-7140 Ludwigsburg, and Rolf Reischl, Linzerstrasse 44, D-7000 Stuttgart 30, both of Fed. Rep. of Germany

Filed Oct. 14, 1982, Ser. No. 434,181
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149136
Int. Cl.³ F02M 51/00
U.S. Cl. 123—489 8 Claims



1. Method of controlling operation of an air-fuel ratio control system for an internal combustion engine (E), having a lambda sensor (1) exposed to the exhaust gases of the engine, means (4,5) for monitoring operating readiness of the sensor

including a d-c reference voltage (U_o) source (5) and a coupling resistor (4) serially connected therewith and with the lambda sensor (1) and a resistance sensing means for evaluating the internal resistance of the sensor, the reference voltage being connected to be polarized opposite to the polarity of the output voltage of the lambda sensor;

threshold means (6, 7, 8, 9, 10) including two comparators (9, 10) each having an output signal state, being connected to the lambda sensor, and connected to respond respectively to upper (U_{max}) and lower (U_{min}) threshold voltage levels, each voltage taking on values respectively above and below the voltage (U_o) of said reference source, and hence evaluating the voltage jump between said values upon change of oxygen content of the exhaust gases from the engine,

said threshold means further comprising resistances (6, 7, 8) which determine said threshold voltages,

and air-fuel control means (20, AF) controlling the air-fuel ratio, of the air-fuel mixture being supplied to the engine, selectively, in accordance with signals derived from said lambda sensor, when said sensor is in condition to maintain a minimum threshold voltage signal output, or in accordance with a preset ratio, when said sensor fails to maintain said threshold voltage output,

said method comprising, in accordance with the invention, the steps of

feeding the outputs of said sensor and said reference voltage source to a junction,

applying the output signal from said junction to one of the inputs of each of said comparators (9, 10),

selecting said resistances such that said maximum threshold voltage (U_{max}) takes on a value not symmetrical to said reference voltage (U_o) with respect to the value of said minimum threshold voltage (U_{min}), but rather is displaced in the direction of a higher value than the value of said minimum threshold voltage,

starting the operation of said engine with said control means (20, AF) controlling the air-fuel mixture in accordance with said preset ratio ,

upon receipt of signals from said threshold comparators (9, 10) indicating a change in their output state, switching said control means (20, AF) to control in accordance with signals from said comparators (9, 10), and

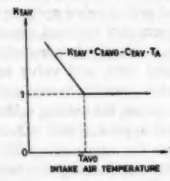
in the absence of signals from said comparators (9, 10) for a predetermined period of time, switching said control means back to control in accordance with said preset ratio.

4,492,206

DEVICE FOR INTAKE AIR TEMPERATURE-DEPENDENT CORRECTION OF AIR/FUEL RATIO FOR INTERNAL COMBUSTION ENGINES

Shunpei Hasegawa, Niiza, and Akihiro Yamato, Sayama, both of Japan, assignors to Honda Motor Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1982, Ser. No. 442,614
Claims priority, application Japan, Nov. 20, 1981, 56-186631
Int. Cl.³ F02M *17/00*
U.S. Cl. 123—491 **2 Claims**



1. In a fuel supply control system for use with an internal combustion engine having an intake pipe, said system including means for determining a basic value of the air/fuel ratio of an air/fuel mixture being supplied to said engine, as a function of at least one parameter representing operating conditions of said engine, an air/fuel ratio correcting device comprising:

a sensor for detecting a value of intake air temperature in said intake pipe of said engine;

means for setting a predetermined value of the intake air temperature which falls within a range of intake air temperature at which fuel injected into the intake pipe of the engine can be completely evaporated within a period of time between the injection of the fuel and ignition of the injected fuel;

means for determining a value of a correction coefficient solely as a function of a value of the intake air temperature detected by said sensor in a manner dependent on a value of the evaporation rate of fuel within said period of time between the injection of the fuel and ignition of the injected fuel, said value of the evaporation rate of fuel being given solely as a function of the intake air temperature, said value of said correction coefficient having (i) a predetermined constant value when the intake air temperature has a value higher than said predetermined value thereof, and having (ii) a value increasing as the intake air temperature has a value thereof decreasing from said predetermined value; and

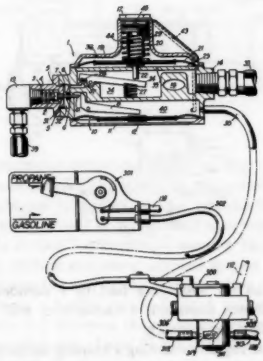
means for correcting a basic value of the air/fuel ratio of said air/fuel mixture determined by said basic value determining means, by multiplying said basic value by an amount corresponding to a value of said correction coefficient determined by said correction coefficient determining means.

4,492,207

DUAL FUEL SYSTEM

John E. Hallberg, Peachtree City, Ga., assignor to PetroSystems International, Inc., Nashville, Tenn.

Filed Feb. 27, 1981, Ser. No. 239,005
Int. Cl.³ F02B *43/00*; F02M *21/04*
U.S. Cl. 123—527 **25 Claims**



2. A dual fuel system for an internal combustion engine comprising:

(a) a converter body forming a liquified fuel passage and a gaseous fuel chamber;

(b) a liquid fuel inlet valve yieldably biased toward a closed position and a first actuator responsive to a drop in engine manifold pressure to actuate the liquid fuel inlet valve for permitting fuel to flow into the liquified fuel passage;

(c) a gaseous fuel inlet valve between the liquified fuel pas-

sage and the gaseous fuel chamber which valve is yieldably biased toward a closed position and a second actuator responsive to a pressure drop in the gaseous fuel chamber to actuate the gaseous fuel valve for permitting fuel flow into the gaseous fuel chamber;

(d) a mixer body forming an air passage and a pressurized gaseous fuel passage communicating with the gaseous fuel chamber and having an orifice communicating with the air passage;

(e) a plunger proximate the air passage for movement to variably restrict air flow through the air passage;

(f) a means for yieldably biasing the plunger in one direction of movement, the plunger having a surface communicating with the air passage at the downstream side of the plunger to receive application of vacuum tending to move the plunger in the opposite direction against resistance imposed by the yieldable bias means;

(g) a needle positionable within the orifice, one of the orifice and needle being movable relative to the other by the plunger to control the flow of gaseous fuel through the orifice;

(h) a valve body having a liquid inlet opening, a vacuum outlet opening, a vacuum inlet port, a vacuum outlet port communicating with the first actuator, and a vent; and

(i) a spool rotatable within the valve body in response to a control, said spool having a tunnel communicating between the liquid inlet opening and the liquid outlet opening when the control is in a first position, a duct communicating between the vacuum inlet port and the vacuum outlet port when the control is in a second position, and a notch communicating between the vacuum outlet port and the vent when the control is in the first position.

4,492,208

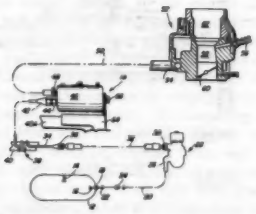
LIQUID PROPANE GAS FUEL SYSTEM

Mark S. Lent, Golden Valley, Minn., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Jul. 1, 1983, Ser. No. 510,112

Int. Cl.³ F02B *43/00*

U.S. Cl. 123—527 **11 Claims**



1. Apparatus for supplying fuel to a combustion engine having an exhaust manifold, a carburetor, and a supply of liquefied gas fuel, comprising:

(a) a pressure regulator having a housing defining an internal chamber, a fuel inlet in said housing in fluid communication with said chamber, means for coupling a fuel supply line to said fuel inlet, a fuel outlet in said housing in fluid communication with said chamber, and means for coupling said fuel outlet to the carburetor; and

(b) bracket means for transferring heat to said pressure regulator in proportion to the engine load and characterized by a heat flux time constant such that the rate of change of temperature of said pressure regulator is proportional to the rate at which said engine increases in temperature during the warm-up time of said engine.

4,492,209

EXHAUST GAS RECIRCULATION SYSTEM

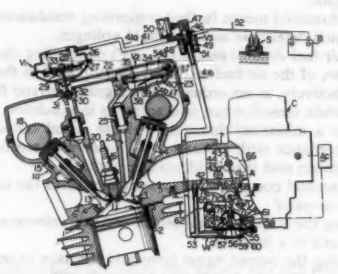
Junji Otani, Oomiya; Yasuo Ikenoya, Kawagoe, and Masafumi Araki, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1982, Ser. No. 386,209

Claims priority, application Japan, Jun. 5, 1981, 56-86608; Jul. 3, 1981, 56-104238

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—568 **3 Claims**



1. In an exhaust gas recirculation system for an internal combustion engine, comprising: an exhaust pick-up port communicating with an exhaust passage; an exhaust gas recirculation port communicating with an intake passage having therein a throttle valve; and an exhaust gas recirculation passage providing communication between said exhaust pick-up port and said exhaust gas recirculation port so that the exhaust gas in said exhaust passage may be partially recirculated into said intake passage by the intake pressure prevailing in said intake passage,

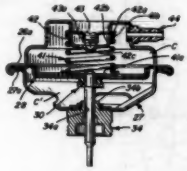
the improvement comprising; a vacuum-operated type exhaust gas recirculation valve disposed midway of said exhaust gas recirculation passage for regulating and controlling the flow rate of the exhaust gas to flow in said exhaust gas recirculation passage; a vacuum supply passage opening to said intake passage downstream of said throttle valve for providing communication of a vacuum chamber of said exhaust gas recirculation valve with said intake passage; a vacuum control valve connected with said vacuum supply passage for controlling the vacuum force of intake air to flow in said vacuum supply passage, wherein said vacuum control valve includes a valve housing, a diaphragm partitioning the inside of said valve housing into a vacuum chamber communicating with said vacuum supply passage and an atmospheric chamber vented to the atmosphere, a valve seat formed on said diaphragm and formed with a valve opening for providing communication between said vacuum chamber and said atmospheric chamber, a valve body adapted to be brought into and out of contact with said valve seat and made coactive with said valve seat for forming a variable orifice, and a diaphragm spring for biasing said diaphragm so that said valve seat may approach said valve body; and an interlocking mechanism for interlocking said vacuum and said throttle valve, said interlocking mechanism having a control member disposed between said vacuum control valve and said throttle valve for providing positive control of the interlocking relation between those valves.

4,492,210

SERVICEABLE VALVE CONSTRUCTION

Donald E. Hunt, New Haven, Mo., assignor to Ballwin-Washington, Inc., Washington, Mo.

Filed Feb. 18, 1983, Ser. No. 467,774
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—568 **3 Claims**



2. A serviceable valve for controlling the recirculation of exhaust gases within an internal combustion engine, comprising a housing having a first section provided with an interior chamber, and a second section secured to and subtending said first section; a diaphragm affixed to and interposed said housing sections, said diaphragm being in communication with said chamber and in response to a predetermined pressure within said chamber having a portion of the diaphragm movable in one direction from a predetermined rest position; a fitting mounted on and subtending said housing second section whereby said housing and diaphragm are rotatable as a unit about an axis of said fitting to selected positions of adjustment, said fitting being adapted to be removably mounted on the engine; a stem assembly carried by said diaphragm and being movable in response to the movement of said diaphragm portion, said assembly having an elongated stem member operatively connected to said diaphragm and in coaxial relation with said fitting axis, one end of said stem member having a valve piece mounted thereon for coaction with a valve seat provided on the engine and disposed within a recirculation flow path of the exhaust gases within the engine whereby, when said valve piece is seated on the valve seat, recirculation of the exhaust gases through the engine is blocked; a port formed in said housing first section and communicating with the chamber therein, said port being offset with respect to the fitting axis and being adapted to be removably connected to a pressure fluctuating segment of the engine; and means coacting with said fitting and said housing second section to releasably retain said housing and diaphragm in a selected position of adjustment relative to said fitting; said fitting including a substantially cylindrical portion protruding upwardly from a surface of said fitting, said protruding portion extending through an opening formed in said housing second section and terminating within the interior thereof, and means coacting with the terminating protruding portion and resiliently biasing the portion of said housing second section circumjacent said opening into a predetermined frictional engagement with said fitting surface and effect retention of said housing and diaphragm in a selected position of adjustment relative to said fitting.

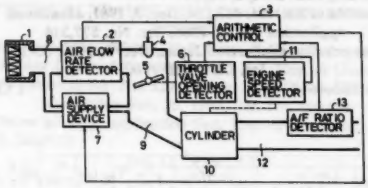
4,492,211

AIR-TO-FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Setsuhiro Shimomura, and Yuuji Kishimoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1982, Ser. No. 409,226
Claims priority, application Japan, Aug. 19, 1981, 56-130763
Int. Cl.³ F02D *5/02, 9/02;* F02M *25/06*
U.S. Cl. 123—585 **2 Claims**

1. In an electric-type air-to-fuel ratio control system for an internal combustion engine including fuel flow rate adjusting means disposed upstream of a branch point in an intake manifold of the engine, an arithmetic control device for driving the fuel flow rate adjusting means in accordance with outputs of a plurality of sensing means for sensing predetermined operating parameters of said engine, and a throttle valve disposed in said intake manifold at a point downstream of said fuel flow rate adjusting means, the improvement comprising: bypass air supplying means for supplying air into said intake manifold at a point downstream of both said fuel flow rate adjusting means and said throttle valve, said air supplying means being actuated



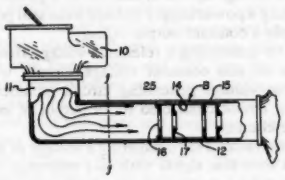
to supply air in response to at least one of the rate of closing of said throttle valve and changes in sensed operating parameters of said engine, said air supplying means being electrically controlled by said arithmetic control means; wherein a first one of said sensing means comprises intake air flow rate detecting means disposed in said intake manifold, and wherein said air supplying means is connected to bypass siad intake air flow rate detecting means.

4,492,212

INTERNAL COMBUSTION ENGINE OF IMPROVED EFFICIENCY

Richard L. Dooley, 921 Maple Ave., Lisle, Ill. 60532

Filed Aug. 9, 1982, Ser. No. 406,203
Int. Cl.³ F02M *29/00*
U.S. Cl. 123—590 **6 Claims**



1. In an internal combustion engine having a plurality of cylinders, a carburetor and a manifold, said manifold having a log section adapted to receive fuel-gas mixture from said carburetor, and a plurality of finger sections each being connected independently to said log section to receive fuel-gas mixture from said log section and being adapted to pass fuel-gas mixture forwardly to the end of the finger section, the improvement comprising a baffle device located within one of said finger sections and between the place of beginning laminate flow and the outlet end of said finger, said device including a pair of plates each of which has a central opening therein and the second of which is disposed downstream of said first plate, said plates forming between them an area wholly within said finger section and containing fuel-gas mixture in a turbulent state.

4. A method for assembling an internal combustion engine having a carburetor and a log section into which fuel-gas mixture from the carburetor is passed and having finger sections which are adapted to receive fuel-gas mixture separately from said log section and through which the fuel-gas mixture passes to the outlet end of the finger sections, the step of inserting into said outlet of a finger section a device having a pair of

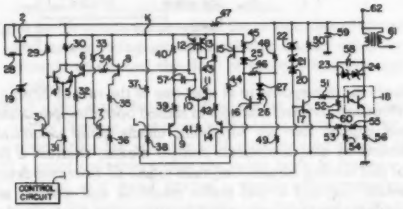
spaced plates having central openings therein until said device is wholly contained within said one finger section.

4,492,213

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Noboru Yamamoto; Ryoichi Okuda, both of Kariya, and Tomoatsu Makino, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 327,114, Dec. 3, 1981, abandoned. This application Feb. 6, 1984, Ser. No. 577,316
Claims priority, application Japan, Dec. 8, 1980, 55-172790
Int. Cl.³ F02P 1/00
U.S. Cl. 123—644 1 Claim



1. An ignition system for internal combustion engines for effecting constant current control of an ignition coil primary current comprising:

an ignition coil;

an adjusting circuit for adjusting a magnitude of an interrupted primary current of said ignition coil;

a circuit for detecting the magnitude of the interrupted primary current of said ignition coil and generating a primary current detection signal;

a constant voltage circuit connected to a power supply and regulating a power supply voltage from said power supply to supply a constant output voltage;

a circuit for generating a reference voltage from an output voltage of said constant voltage circuit, wherein said reference voltage generating circuit includes a voltage dividing circuit connected to an output of said constant voltage circuit;

a comparison circuit for comparing a voltage of said primary current detection signal with said reference voltage and supplying an output signal as an adjusting signal of said adjusting circuit;

a circuit for detecting a decrease of said power supply voltage below a voltage regulation threshold input level of said constant voltage circuit; and

a compensating circuit responsive to a detection output of said power supply voltage decrease detecting circuit to increase said reference voltage substantially in proportion to the decrease of said power supply voltage below the voltage regulation threshold input level of said constant voltage circuit, and wherein said compensating circuit comprises a transistor circuit having a collector-emitter circuit connected in series between the output of said constant voltage circuit and a voltage dividing point of said voltage dividing circuit, and a base voltage adjusting circuit responsive to the detection output of said power supply voltage decrease detecting circuit to vary a base voltage of a transistor comprised in said transistor circuit so as to increase conduction through said transistor circuit in proportion to the decrease of said power supply voltage,

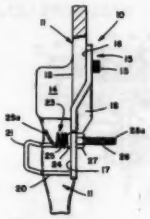
whereby the magnitude of the interrupted primary current of said ignition coil is controlled at a given constant value irrespective of the decrease of said power supply voltage to a level lower than the voltage regulation threshold input level of said constant voltage circuit.

4,492,214

ARCHERY BOW WITH ARROW REST THEREFOR

Karey Kielhoffer, P.O. Box 992, Morongo Valley, Calif. 92256

Filed Aug. 13, 1982, Ser. No. 407,706
Int. Cl.³ F41B 5/00
U.S. Cl. 124—24 R 5 Claims



1. An overdraw arrow rest unit comprising:

a flat elongated bar element with a central offset between its ends, said bar element having a first planer surface at one end for attaching it to a bow and a second planer surface forming a rest portion at its opposite end with said two surface portions connected by said central offset, said first and second surfaces being in an offset spaced apart parallel relationship;

a base rest element fixedly attached to the bottom edge of the rest portion of said elongated bar element adjacent to its distal end and projecting perpendicularly from said second planer surface, said rest element having an upwardly directed distal end operable to prevent arrows from sliding off said rest element;

an arrow rest means located between said first planar surface and said base rest element in the central position of said rest surface and secured therein operable to provide a support for resting the head portion of an arrow thereon; and,

attaching means operable to fixedly attach said first planer surface to a bow whereby said unit can be attached to a bow to provide an arrow rest between a bow and a bow string to allow an archer to use shorter arrows and also to provide a safety base rest element between a bow string and an arrow rest.

4,492,215

OUTDOOR PORTABLE CHARCOAL GAS GRILL

Florindo DiGianvittorio, 62 Webster St., East Boston, Mass. 02128

Filed Apr. 2, 1984, Ser. No. 595,657
Int. Cl.³ F24C 1/16; B65D 6/12; F16M 11/32
U.S. Cl. 126—9 R 28 Claims

1. In a portable outdoor grill a collapsible housing for accommodating a burner, comprising:

a base for supporting the burner thereon;

a pair of spaced apart front and rear walls;

a pair of spaced apart side walls; each wall in each pair of walls including means for releasably interlocking with complementary means on each associated wall of the other pair of walls;

means for detachably mounting at least one of said walls to said base;

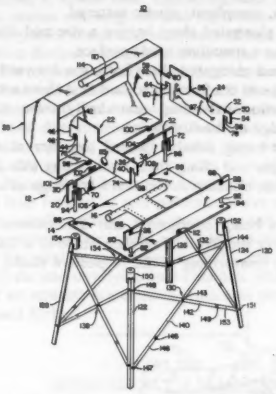
a cover;

first hinge means carried by one of said walls;

second hinge means carried by said base; and

third hinge means carried by said cover for engaging said first hinge means to permit hinged attachment of said cover to said wall when said wall is erected on said base

and for engaging said second hinge means to permit hinged attachment of said cover to said base when said



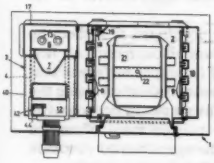
walls are detached from said base to form a portable housing for the walls.

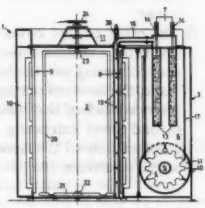
4,492,216

OVEN WITH AIR CONVECTION COMBUSTION, MORE PARTICULARLY FOR BAKEHOUSES

Philippe Dumont, Montreuil, France, assignor to Dumont S.A., Montreuil, France

Filed Nov. 9, 1982, Ser. No. 440,337
Claims priority, application France, Nov. 13, 1981, 81 21237
Int. Cl.³ F24C *1/00*; A47J *00/00*; F27B *9/04*
U.S. Cl. 126—21 A **6 Claims**





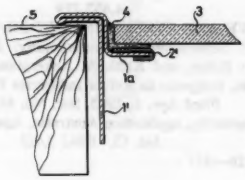
1. A baking oven with air convection combustion comprising: a baking chamber having walls and a door opening; a fire-box; a burner operatively disposed in said fire-box; a vertical primary exhaust duct connected to said fire-box for exhausting the hot gases therefrom and forming a primary circuit therewith; a closed heating duct adjacent the baking chamber surrounding said fire-box and said exhaust duct and forming a secondary circuit for providing secondary air heated to about 200°–300° C. by contact with said exhaust duct and fire-box; a plurality of adjustable input nozzles mounted on the oven in spaced relationship over the height of and on one side of the baking chamber operatively connecting said heating unit to said chamber for conducting air from said secondary circuit to said chamber; adjustable exhaust nozzles mounted on the side of said baking chamber opposite the intake nozzles for exhausting said chamber; a chamber exhaust duct operatively connected to said exhaust nozzles for collecting the secondary air from said exhaust nozzles and returning it to said heating duct; a turbine mounted on a horizontal axis situated above said fire-box and operatively connecting said chamber exhaust duct to said heating duct for recycling said secondary air; a vapor producing humidifier means; a vertical ramp mounted within said baking chamber adjacent the input nozzle side thereof; a humidifier duct connecting said humidifier means with said ramp; and bore holes disposed along said ramp to inject vapor produced by said humidifier means into said baking chamber in the vicinity of said input nozzles.

4,492,217

PANEL ASSEMBLY, PARTICULARLY A GLASS OR VITREOUS CERAMIC HEATER OR COOKER PANEL ASSEMBLY

Herwig Scheidler, Mainz, Fed. Rep. of Germany, assignor to JENAer Glaswerk Schott & Gen., Fed. Rep. of Germany

Continuation of Ser. No. 32,873, Apr. 24, 1979, abandoned. This application Feb. 25, 1983, Ser. No. 469,976
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1978, 2819118
Int. Cl.³ F24C *3/00*
U.S. Cl. 126—39 B **9 Claims**



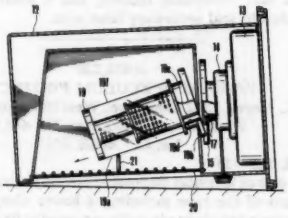
1. A heating panel assembly comprising:
a glass hob plate;
a supporting frame for said hob plate having a first frame profile including a flange extending beneath said hob plate for supporting said hob plate such that a gap exists between the bottom and sides of said hob plate and said first frame profile, a second frame profile covering a portion of said first profile adjacent said hob plate rigidly connecting said first and second profiles during assembly; and
a thermostable elastic adhesive completely filling said gap between said first profile and said hob plate sides and further disposed between said second profile and said hob plate bottom for bonding said first profile, said second profile and said hob plate and forming a non-detachable continuous joint between said first profile and said hob plate, said surface of said second profile being comprised of a material selected for forming a strong mechanical bond with said adhesive.

4,492,218

OIL STOVE

Tetsue Uchida, and Takao Adachi, both of Sanjyo, Japan, assignors to Uchida Manufacturing Co., Ltd., Japan

Filed Feb. 25, 1983, Ser. No. 469,908
Int. Cl.³ F24C *5/04*
U.S. Cl. 126—96 **3 Claims**



1. An oil stove comprising:

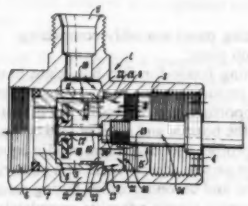
a base;
a cabinet mounted on said base and extending upward therefrom;
a hot dish mounted in said cabinet;
a burning sleeve removably mounted in said cabinet on said hot dish for defining a burning chamber at its lower end and extending upward from said hot dish at said lower end to an upper end;
a cylindrical burning wick adapted to be displaced upwardly and downwardly in said burning chamber;
a guard formed of a plurality of horizontally extending rods fixed to a plurality of vertically extending rods; and
a guide member fixedly secured to said guard and extending inwardly therein, said guide member including means defining a surface which comes into contact with said upper end of said burning sleeve when said stove falls over in a forward direction and to thereafter permit said burning sleeve to slide along said defined surface of said guide member to part said lower end from said hot dish.

4,492,219

VALVE AND SYSTEM INCORPORATING SAME

Marcus F. Schoenheimer, Indooroopilly; Lionel A. Gaskell, Bracken Ridge, and Keith A. Ackermann, Lawnton, all of Australia, assignors to Actrol Industries Pty. Ltd., Australia

Filed Apr. 1, 1983, Ser. No. 481,564
Claims priority, application Australia, Apr. 6, 1982, PF3499
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—427 **12 Claims**



10. A fluid heating system including: a storage container; a fluid circulating loop having opposite ends respectively connected to an outlet and an inlet of said container; fluid heating means within said loop; means for drawing fluid from said container; a temperature responsive valve connected to said loop between said heating means and said container outlet and including a hollow body, a chamber within said body, a primary inlet port which is connected to said container outlet, a secondary inlet port, each of said inlet ports communicating with said chamber so as to be in continual communication with one another, an outlet port communicating with said chamber through an orifice within said body and being connected to that part of said loop which leads to said heating means, a valve member mounted within said body for movement towards and away from a position at which it closes said orifice, and a temperature responsive means located within or adjacent said primary inlet port and connected to said valve member so as to control said movement thereof; and a source of said fluid connected to said secondary inlet port.

4,492,220

VAGINAL SPECULUM PROTECTOR

Allen L. Hayes, 7362 Creekview, West Bloomfield, Mich. 48033

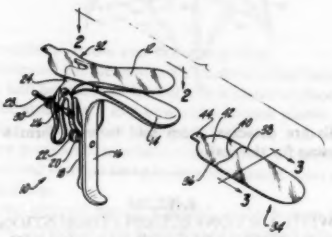
Filed Nov. 15, 1982, Ser. No. 441,703
Int. Cl.³ A61B *1/32*
U.S. Cl. 128—17 **3 Claims**

1. A pair of identical disposable covers for use with a vaginal speculum of the type including a lower elongated blade, an upper elongated blade pivotally mounted at its rearward end to the rearward end of the lower blade, and a handle formed integrally with the rearward end of the lower blade and extending downwardly therefrom:

A. each cover comprising first and second elongated sheets of a smooth, compliant, plastic material,
   1. said first elongated sheet having a size and shape conforming to a speculum blade surface,
   2. said second elongated sheet having a forward portion overlying and conforming to said first sheet and a rearward portion extending rearwardly from the rearwardly edge of the first sheet;

B. said sheets being suitably joined together along their forward edges and along their confronting side edges to form a pocket opening at the rearward edge of said first sheet;

C. said covers being configured and dimensioned to slip smoothly over the free end of each blade to a fitted position snuggly conforming to the respective blade;



D. One of said covers, when positioned second sheet up and fitted over the upper speculum blade, having its first sheet covering substantially all of the lower surface of that blade, the forward portion of its second sheet covering the upper surface of that blade, and the rearward portion of its second sheet extending rearwardly of the rearward end of that blade to facilitate application and removal of the cover;

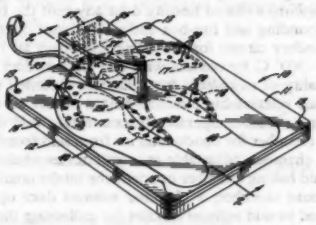
E. the other of said covers, when positioned first sheet up and fitted over the lower speculum blade, having its first sheet covering substantially all of the upper surface of that blade, the forward portion of its second sheet covering the lower surface of that blade, and the rearward portion of its second sheet extending downwardly in front of and in juxtaposition to the handle of the speculum to preclude contact between the patient and the handle.

4,492,221

DEVICE FOR RELAXING AND REFRESHING HANDS OR FEET

Eddie F. Kerley, 3313 Bildahl St., Rockford, Ill. 61109

Filed Feb. 18, 1983, Ser. No. 467,735
Int. Cl.³ A61H *21/00*
U.S. Cl. 128—24.1 **13 Claims**



1. A device for relaxing and refreshing left and right terminal limbs having digits, said device comprising an upper, gen-

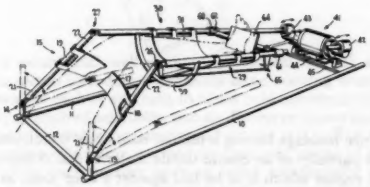
erally horizontal platform of sufficient length and width to enable left and right limbs to rest on the platform in side-by-side relation, a lower base underlying and supporting said platform, means defining left and right sets of channels between said platform and said base, each of said sets comprising at least two distinct channels positioned to underlie different areas of the respective limb, a manifold between said platform and said base and communicating with all of said channels, said means comprising a plate sandwiched between said platform and said base, slots formed through said plate and defining said channels, an opening formed in said plate and defining said manifold, the upper and lower sides of said slots and said opening being closed by said platform and said base, respectively, a hole formed in said platform above said manifold, a rotatable impeller alined with said hole and operable when rotated to circulate air in said manifold and into said channels, a motor for rotating said impeller, and ports formed through said platform and overlying said channels whereby upwardly directed air streams are emitted from said ports to relax and refresh said limbs.

4,492,222

KNEE EXERCISE MACHINE

Mohamad-Ali Hajianpour, Miami Springs, Fla., assignor to Diversified Medical Systems, Inc., South Miami, Fla.

Filed Mar. 9, 1983, Ser. No. 473,541
Int. Cl.³ A61H *1/02*
U.S. Cl. 128—25 R **15 Claims**



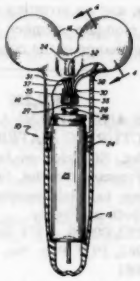
1. An automatic knee exerciser comprising:
a frame;
a thigh support member having proximal and distal ends;
a leg support member having proximal and distal ends;
a motor assembly;
means connecting said proximal end of said thigh support member to said frame for pivotal movement about a first horizontal axis which is fixed relative to said frame;
means rigidly connecting said distal end of said leg support member to said motor assembly;
means mounting said motor assembly on said frame for pivotal movement about a second horizontal axis which is fixed relative to said frame and located in spaced parallel relation to said first horizontal axis;
pivot means joining the distal end of said thigh support means to the proximal end of said leg support means for mutual pivotal motion about a third horizontal axis which is movable relative to said frame and located in spaced parallel relation to said first and said second horizontal axes;
actuator means drivingly interconnected to said motor assembly and thereby providing a driving force applied to said leg support member for selectively axially extending and retracting said leg support member to move said pivot means and said third horizontal axis and to thereby cause said leg support member to pivot with respect to said thigh support means about said third horizontal axis;
said leg support member including a first elongated member secured to said pivot means so as to move therewith and further movably interconnected to said actuator means so as to move relative thereto;
said first elongated member and said actuator means attached in coaxial relation to one another along a common longitudinal axis thereof and relatively disposed to apply said driving force along said common longitudinal axis.

4,492,223

FLUID DISPENSING MASSAGE DEVICE

James E. Burke, Shelton, Conn., assignor to Jack B. Hosid, Fairfield, Conn.

Filed Jun. 30, 1982, Ser. No. 393,683
Int. Cl.³ A61H *15/00*
U.S. Cl. 128—57 **3 Claims**



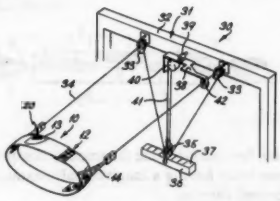
1. In a fluid dispensing massage device including a pair of rollable members adapted to engage the area to be massaged and a handle assembly having a bifurcated extension for supporting the rollable members, the handle assembly having separable upper and lower portions, the improvement comprising a replaceable cartridge containing fluid under pressure positioned in the lower portion of the handle assembly and extending upwardly therefrom into the upper portion, the cartridge including a metered valve that dispenses a metered amount of fluid from the cartridge when actuated, movable means in the upper portion of the handle assembly for actuating the metered valve, the valve extending upwardly into engagement with the movable actuating means, and a flexible tube extending from the actuating means to each rollable member for delivering fluid from the cartridge to the members, the tubes having sufficient slack to permit movement of the actuating means.

4,492,224

ORTHOPAEDIC TRACTION APPARATUS

Terence Singleton, Manchester, England, assignor to National Research Development Corporation, London, England

Filed Feb. 10, 1983, Ser. No. 465,456
Claims priority, application United Kingdom, Feb. 13, 1982, 8204290; Feb. 13, 1982, 8204291; Nov. 16, 1982, 8232623
Int. Cl.³ A61H *1/02*
U.S. Cl. 128—75 **9 Claims**



1. Orthopaedic traction apparatus comprising:

a support structure;
first guide means carried by said support structure;
connection means securable to the body of a patient;
a load;
a first elongate flexible member operably connected to extend under tension between said connection means and said load, and to engage therebetween said first guide means, to apply tractive force to said patient; and
a safety mechanism including a second elongate flexible member operably connected to extend between said support structure and said load, a retractor allowing extension of said second elongate member against a continuous return action, and an arresting element operable to lock said second elongate member in response to predetermined mobile change in the condition of said mechanism.

4,492,225

CRADLES AND MINERVA JACKETS, AND MANUFACTURING MATERIAL THEREFOR

Jean-Pierre Picolet, St Priest-en-Jarez; Jean-Loup Rudloff, Nanterre, and Francois Courtet, St Bonnet-les-Oules, all of France, assignors to Etablissements Thuasne & Cie and Thuasne-Paris, both of, France

PCT No. PCT/FR82/00030, § 371 Date Nov. 9, 1982, § 102(e) Date Nov. 9, 1982, PCT Pub. No. WO82/03005, PCT Pub. Date Sep. 16, 1982
PCT Filed Feb. 19, 1982, Ser. No. 448,995
Claims priority, application France, Mar. 10, 1981, 81 04715
Int. Cl.³ A61F 5/04
U.S. Cl. 128—87 R 17 Claims

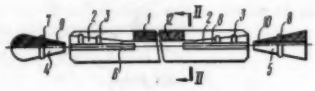
1. A surgical cradle for supporting the heads or members of persons or animals comprising a layered panel formed by the assembly of a layer of plastic material in the form of hard foam, a sheet of preferably inelastic metal, a layer of plastic material in the form of flexible foam, and a flexible and smooth protective internal sheet, said metal sheet is cut into a predetermined form related to the member being protected.

4,492,226

DEVICE FOR UNITING BONE FRAGMENTS

Sergei I. Belykh, Moscow; Anatoly D. Moschensky, Malakhovka; Anatoly B. Davydov, Moscow; Gely G. Pershin, Moscow; Boris A. Smirnov, Moscow, and Mikhail V. Gromov, Moscow, all of U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky I Ispytatelny Institut Meditsinskoi Tekhniki, Moscow, U.S.S.R.

Filed Oct. 10, 1979, Ser. No. 83,310
Int. Cl.³ A61F 5/04
U.S. Cl. 128—92 BC 5 Claims



1. A device for uniting bone fragments, comprising:
a rectilinear body having a longitudinally-extending through bore formed therein;
holes coaxial to said body, provided at opposite end portions thereof and shaped as frustums of cones facing with their greater bases the respective ends of said body;
annular grooves made in the bore surfaces of said holes;
longitudinal through slots made in said end portions of said body within the zones of said holes;
cone-shaped inserts adapted for being introduced into said holes so as to wedge apart said body at the both ends thereof;
annular ridges made on said inserts and adapted to fit in said annular grooves so as to hold said inserts in positions wedging apart said end portions of said body;
said device featuring its length less than a total length of the coapted bone frament so that it can be arranged fully in the bone tissues.

4,492,227

ELASTIC KNEE BANDAGE

Urs Senn, Basel, and Bernhard Segesser, Riehen, both of Switzerland, assignors to Senn & Co. AG, Basel, Switzerland

Filed May 23, 1983, Ser. No. 496,851
Claims priority, application Switzerland, May 27, 1982, 3270/82
Int. Cl.³ A61F 13/00
U.S. Cl. 128—165 12 Claims

1. Knee bandage having a tubular base body which consists at least partially of an elastic textile material and comprises a central region which is to be laid against a knee joint, as well as two edge sections which adjoin this central region on both sides and the stretch properties of which differ from those of the central region, characterised in that, when the central region (II) and edge sections (I, III) are equally loaded, the central region (II) has an elastic stretch in the longitudinal and transverse directions which is at least 100% greater than that of the edge sections (I, III), that two zones (4) for stabilising the joint flanks are provided on the base body (1), which zones are each inclined relative to the longitudinal centre line (A) of the base body by an angle of 15°–45° and are arranged, on the one hand, to converge towards one another up to a region on the base body located below the position to be envisaged for the knee joint and, on the other hand, to extend beyond the knee region, and that at least that edge section (I) which adjoins the central region above the knee region is provided on the inside of its upper edge part with a holding strip (2) made of material which is resistant to sliding.

4,492,228

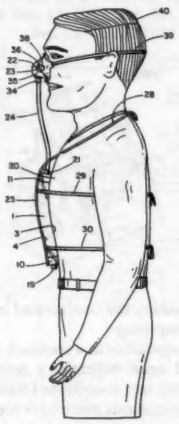
AIR WARMING DEVICE TO FACILITATE BREATHING

Edward M. Makovic, 510 N. Lincoln, Coal City, Ill. 60416

Filed Dec. 16, 1982, Ser. No. 449,888
Int. Cl.³ A61M 15/00
U.S. Cl. 128—204.17 9 Claims

1. An air warming device to facilitate breathing comprising a warming chamber having a peripheral wall comprising a first side wall, a second side wall spaced apart from said first side wall to define warming cavity means therebetween to warm the contents within said cavity means, securing means to secure and hold said warming chamber against a portion of the body of a user, said first side wall being imperforate and adapted for facing the body of said user to transmit body heat from said user to the interior of said warming cavity means, air

intake means to admit cold outside air into said warming cavity means, air discharge means to discharge warmed air from said warming cavity means, and air conduit means to conduct said warmed air from said air discharge means to said user to enable said user to breathe said warmed air, wherein said warming cavity means includes a plurality of elongated cells, each of said cells including imperforate side wall means connected between said first and second side walls and surrounding a cavity therein, a first end wall at one end of each of said cells



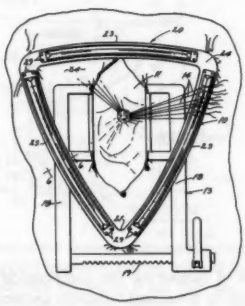
and a second end wall at the opposite end thereof, said air intake means including a relatively large opening in said first end wall of each of said cells to admit cold outside air into said cavity of each of said cells, said air discharge means including a relatively smaller opening in said second end wall of each of said cells to discharge warmed air from said cavity of each of said cells, each smaller opening being substantially aligned with and in substantial registration with a corresponding one of said large openings and in unobstructed open communication therewith.

4,492,229

SUTURE GUIDE HOLDER

Ronald P. Grunwald, 203 Deaconess Doctors Bldg., Spokane, Wash. 99204

Filed Sep. 3, 1982, Ser. No. 414,603
Int. Cl.³ A61B *17/00*
U.S. Cl. 128—303 R **16 Claims**



10. A holder for securing elongated suture guides having towel clip mounting holes about a surgical incision site comprising:

a rigid frame member having upper and lower surfaces and a central opening of the approximate size of the surgical incision site extending between the upper and lower surfaces;

support means on the frame member for securing the frame member in a selected position relative to the surgical incision site;

mounting means on the upper surface of the frame member for receiving and releasably securing a suture guide; and

wherein the mounting means is comprised of:

upwardly projecting studs on the upper surface of the rigid frame adapted to be releasably received through the towel clip mounting holes;

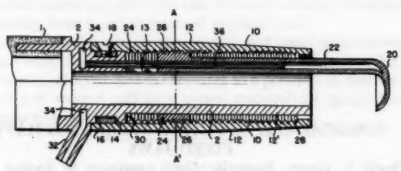
wherein the studs are spaced about the frame and in positions adapted to mount three suture guides in a triangular end-to-end relationship around the frame.

4,492,230

EXTENSION MECHANISM OF ADAPTOR FOR LASER SCALPEL

Katsuyoshi Sunago, and Tomio Iwamoto, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 6, 1982, Ser. No. 395,309
Claims priority, application Japan, Jul. 7, 1981, 56-100952[U]
Int. Cl.³ A61B *17/36*
U.S. Cl. 128—303.1 **6 Claims**



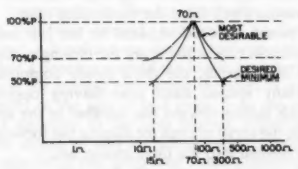
1. An extension mechanism of an adaptor for a laser-powered scalpel, in which an adaptor holding portion of said laser scalpel is provided with a substantially cylindrical main body having a longitudinal axis, said main body supporting an adaptor top portion, said adaptor top portion being reciprocally movable in the longitudinal axial direction of said main body, wherein a sleeve provided with threads on its internal surface is mounted rotatably around said main body, said adaptor top portion including a threaded portion engaging with said threads of the sleeve and positioned between said main body and said sleeve, said adaptor top portion being reciprocally movable by rotating said sleeve.

4,492,231

NON-STICKING ELECTROCAUTERY SYSTEM AND FORCEPS

David C. Auth, 4739 Somerset Ave. Southeast, Bellevue, Wash. 98006

Filed Sep. 17, 1982, Ser. No. 419,400
Int. Cl.³ A61B *17/39*
U.S. Cl. 128—303.17 **10 Claims**



1. A non-sticking electrocautery forceps adapted for use with an RF signal generator producing an RF signal, said

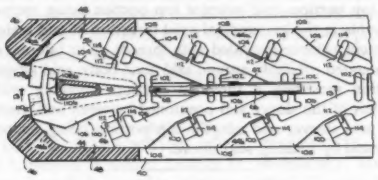
forceps comprising a pair of electrically conductive forceps arms electrically isolated from each other between which said RF signal is adapted to be applied, said forceps arms terminating in respective, closely spaced jaws, each having a tissue contact surface through which said RF signal is adapted to be applied to tissue positioned in contact with said jaws, each of said forceps arms having a volume of heat-absorbing material of at least about 6.5 mm^3 for each mm^2 area of said tissue contact surface, said heat-absorbing material having a thermal conductivity of at least 60 mW/mm°C. such that said heat-absorbing material is capable of both transferring heat at a sufficient rate and absorbing heat in a sufficient quantity to maintain said tissue contact surface at a temperature low enough to prevent tissue from adhering to said tissue contact surface while said forceps delivers power to said tissue to raise the temperature of said tissue to a level sufficient to produce coagulation, said jaws having a relatively hard protective coating applied thereto, thereby chemically isolating tissue from said heat-absorbing material and mechanically protecting said jaws.

4,492,232

SURGICAL CLIP APPLYING APPARATUS HAVING FIXED JAWS

David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Sep. 30, 1982, Ser. No. 429,249
Int. Cl.³ A61B *17/12*
U.S. Cl. 128—325 19 Claims



11. Apparatus for applying a plurality of surgical clips to body tissue one at a time in succession comprising:

a plurality of surgical clips in a linear array, each clip including first and second coupling means for respectively releasably interfitting with the second coupling means of the preceding clip and releasably interfitting with the first coupling means of the succeeding clip so that each clip pulls along the succeeding clip when advanced in the direction away from the succeeding clip;

third means disposed adjacent to, but just beyond the forwardmost clip in the array for closing a clip pushed into the third means, the third means comprising a pair of laterally spaced fixed jaws having opposing surfaces which incline toward one another in the direction away from the array of clips for closing the forwardmost clip as it is pushed into the third means; and

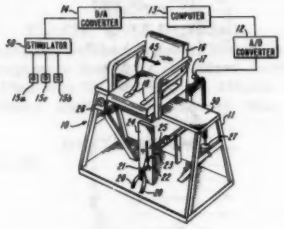
fourth means for engaging the forwardmost clip, pushing the forwardmost clip into the third means, and uncoupling the forwardmost clip from the succeeding clip as the forwardmost clip enters the third means.

4,492,233

METHOD AND APPARATUS FOR PROVIDING FEEDBACK-CONTROLLED MUSCLE STIMULATION

Jerrold S. Petrofsky, Beavercreek; Roger M. Glaser, Dayton; Chandler A. Phillips, Tipp City, all of Ohio, and Steven H. Petrofsky, Florissant, Mo., assignors to Wright State University, Dayton, Ohio

Filed Sep. 14, 1982, Ser. No. 417,934
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—421 17 Claims



1. Apparatus for causing the coordinated motion of a paralyzed human limb comprising:

a microprocessor responsive to a feedback signal for generating a command signal indicating a desired effort by the muscles controlling said coordinated motion of said limb,

at least three transcutaneous electrodes for placement in a spaced apart pattern on the skin above said muscles,

a stimulator responsive to said command signal for generating a pair of stimulation signals comprising alternately generated pulses of stimulation energy,

means for applying said stimulation signals across pairs of said electrodes, and

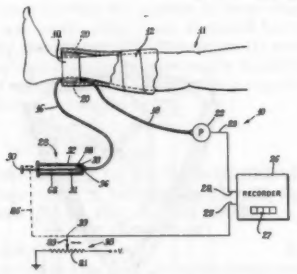
feedback means responsive to the motion of said limb for generating said feedback signal.

4,492,234

PRESSURE MEASUREMENT METHOD

Edward J. Arkans, Hoffman Estates, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed Jul. 2, 1981, Ser. No. 279,744
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—677 7 Claims



1. A method of measuring the compression applied to a portion of a body by a resilient inflatable garment, comprising the steps of:

inserting a flexible pressurizable member between the body portion and the garment to receive the compression applied by the garment; and

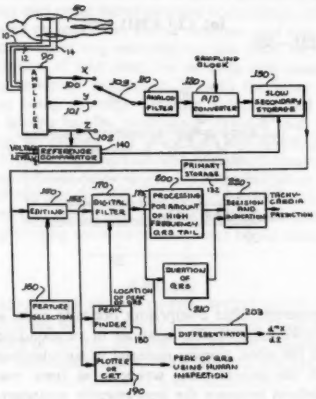
determining the pressure in said member due to the compres-

sion, said pressure being approximately equal to the compression applied to the body portion.

4,492,235
SYSTEM AND METHOD FOR PREDICTING VENTRICULAR TACHYCARDIA BY DERIVATIVE ANALYSIS

David H. Sitrick, Highland Park, Ill., assignor to Arrhythmia Research Technology, Inc., Freeport, Tex.

Filed Feb. 11, 1982, Ser. No. 347,988
Int. Cl.³ A61B 5/04
U.S. Cl. 128—705 26 Claims



1. A system for predicting ventricular tachycardia from electrocardiograph input waveforms comprising:

filter means for providing a high pass filter output responsive to said input waveforms,

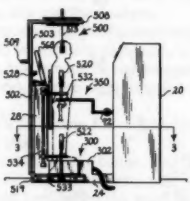
means for providing a time derivative output of said filter output responsive to the filter output,

means for predicting ventricular tachycardia responsive to said time derivative output.

4,492,236
APPARATUS FOR BALANCING SKELETAL ALIGNMENT

Donald L. Pile, 839 N. Kansas Ave., Topeka, Kans. 66608

Filed Nov. 5, 1981, Ser. No. 318,678
Int. Cl.³ A61B 5/10
U.S. Cl. 128—781 21 Claims



1. An apparatus for skeletal alignment comprising:

a patient support assembly having left and right pedal plates for respectively receiving a left foot and right foot of a patient to support said patient in a standing position thereon;

pivot means for mounting said pedal plates in movement about longitudinal and lateral axes passing through each of said plates;

a first measuring device having first and second patient contact tips for engaging selected skeletal features of said patient;

means for mounting said first measuring device to said support assembly in longitudinal and vertical movement relative to said support assembly whereby to provide similar movement of said first and second tips into said engagement with said selected skeletal features;

a lateral measuring device having first and second laterally spaced-apart measuring arms with each arm having a patient contact free end for engaging selected skeletal features of said patient;

means for mounting said lateral measuring device to said support assembly in lateral movement relative to said patient whereby to provide similar movement of said free ends of each measuring arm into laterally spaced-apart engagement with said selected skeletal features of said patient;

a first indicator means operably responsive to said movement of said first and second patient contact tips of said first measuring device to gauge the relative degree of vertical and longitudinal displacement of said first and second patient contact tips and said skeletal features contacted thereby from a predetermined position;

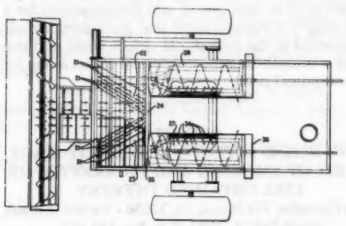
a second indicator means operably responsive to lateral movement of said first and second arms of said lateral measuring device to guage the relative degree of lateral displacement of said patient contact free ends of said lateral measuring arms and said skeletal features contacted thereby from a predetermined position; and

control means for selectively moving said pedal plates about said respective axes to adjust the attitude of said patient and said selected skeletal features to a position so that said first and second indicator means respectively gauge said respective predetermined positions.

4,492,237
ROTARY COMBINE

Daniel Pakosh, Winnipeg, Canada, assignor to Versatile Cornat Corporation, Vancouver, Canada

Filed Aug. 13, 1980, Ser. No. 178,014
Claims priority, application Canada, Aug. 13, 1979, 333765
Int. Cl.³ A01F 7/04
U.S. Cl. 130—27 R 16 Claims



1. A rotary combine for threshing and separating crop comprising crop feed means, a large capacity rotary threshing assembly for carrying out substantially only threshing mounted substantially transversely to the longitudinally axis of said combine, said threshing assembly comprising a substantially cylindrical rotor, a threshing cap around the upper periphery of said rotor and a concave around the lower periphery of said rotor and means for causing crop being threshed to move in a direction parallel to the axis of said rotor from the center of said threshing assembly to the ends thereof, entrance means midway of the length of said threshing assembly operable to receive said crop from said crop feed means, threshing guide means in said threshing assembly to convey crop to an end portion thereof, two rotary separator assemblies mounted substantially transversely to said threshing assembly, one at each end of said threshing assembly, for carrying out substan-

tially only grain and straw separation and having an entrance area adjacent said end portion of said threshing assembly, passage means in said threshing assembly at said end portion to allow passage of said crop from said end portion to the entrance area of said separator assembly, and separating guide means in said separator assembly to convey said crop rearwardly therein, whereby the separator assemblies can be made sufficiently long to accommodate the quantity of crop being threshed in said threshing assembly and the width and length of the combine can be kept to a minimum for a given capacity thresher.

4,492,238

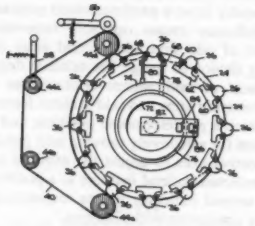
METHOD AND APPARATUS FOR PRODUCTION OF SMOKE FILTER COMPONENTS

Jack C. Wheless, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 307,115, Sep. 30, 1981,. This application Jan. 12, 1982, Ser. No. 338,846

Int. Cl.³ A24C *5/50*

U.S. Cl. 131—94 **24 Claims**



1. An apparatus for shaping a cylindrical object, comprising:

transport means for transporting a cylindrical object along a first predetermined path;

a plurality of heated former means disposed on said transport means, for thermally deforming a portion of the cylindrical object to impart a predetermined desired shape thereto; and

means moving adjacent to and independent of said transport means for maintaining the cylindrical object in operative contact with at least one of said former means for a sufficient length of time to cause said predetermined shape to be imparted to the cylindrical object while said transport means is transporting the cylindrical object along said first predetermined path.

4,492,239

SMOKING BLEND EFFECTIVE TO DISCOURAGE THE BAD HABIT OF SMOKING AND CIGARETTES OR THE LIKE OBTAINED THEREBY

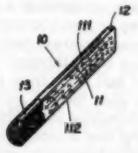
Francesco Cornelio, Via Roma, 13, 33030 - Varmo (Udine), Italy

Filed Feb. 1, 1983, Ser. No. 463,067

Claims priority, application Italy, Oct. 2, 1982, 84107 A/82

Int. Cl.³ A24D *1/00*; A24B *15/30*

U.S. Cl. 131—270 **15 Claims**



1. A smoking blend capable of discouraging the habit of smoking, which comprises tobacco or a tobacco substitute and an antismoking chemical substance which is solid paraformaldehyde of formula $(HCHO)_n$, wherein n is equal to or greater than 3 or formalin.

4,492,240

SMOKE FILTER

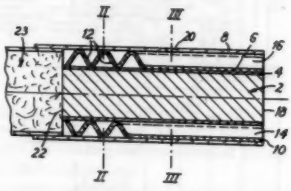
Ernest B. Hayes, 14 Heath Ct., Leighton Buzzard, Bedfordshire, and Anthony S. Cantell, 20 Willow Grove, Old Stratford, Milton Keynes, Buckinghamshire both of England

Filed Jun. 23, 1982, Ser. No. 391,357

Claims priority, application United Kingdom, Jul. 6, 1981, 8120821

Int. Cl.³ A24D *3/04*

U.S. Cl. 131—336 **16 Claims**



11. A cigarette filter comprising opposite ends, a filtering core, a smoke-impermeable wrapper in surrounding engagement with the core, tipping material in surrounding engagement with the impermeable wrapper, at least one internal passage defined between the impermeable wrapper and core and open at an end of the filter, and at least one external passage defined between the impermeable wrapper and tipping material and open at an end of the filter, the tipping material having at least one perforation for the ingress of external air laterally into said external passage.

4,492,241

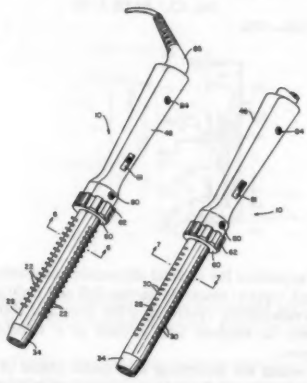
RETRACTABLE CURLING BRUSH

Arnold Thaler, Plantation; David Friedson, Miami, both of Fla., and Lai Kin, Kowloon, Hong Kong, assignors to Windmere Corporation, Hialeah, Fla.

Filed Feb. 19, 1982, Ser. No. 350,185

Int. Cl.³ A45D *2/24*

U.S. Cl. 132—37 R **19 Claims**



1. A retractable hair curling brush comprising: an inner barrel member having a plurality of longitudinally extending

slots and a plurality of recesses extending from each slot transversely along the peripheral surface of said inner barrel member; a handle secured to one end of said inner barrel member; a toothed comb member pivotally mounted in each slot and oriented such that each tooth can be received by one of said recesses; an outer barrel member rotatably mounted around said inner barrel member, said outer barrel member having a plurality of apertures for receiving the teeth of combs; and means for rotating said outer barrel member so that the teeth of said comb members move between an extended position in which each tooth extends outwardly through said apertures of said outer barrel member and a retracted position within the transverse recesses of said inner barrel member with said teeth lying between said inner and outer barrel members, said means for rotating said outer barrel member comprising a ring assembly mounted on said outer barrel member, said ring assembly including; an inner ring mounted on said outer barrel for enabling rotation of said outer barrel with said inner ring; an outer ring mounted concentrically with the inner ring, said outer ring being movable between a locked and unlocked position; biasing means positioned between said inner and outer rings for biasing said outer ring into a locked position; said outer ring being longitudinally movable for unlocking said outer ring and said outer ring being rotatable when unlocked; and means for causing said inner ring to rotate with the outer ring when said outer ring is unlocked with rotation of said inner ring causing rotation of said outer barrel member.

4,492,242

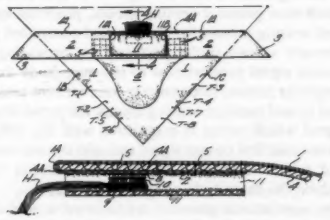
HEAD SCARF FOR WOMEN WITH HAIR LOSS

Betty J. Dalton, 647 N. 16th St., Springfield, Oreg. 97477

Continuation of Ser. No. 397,108, Jul. 12, 1982, abandoned. This application Sep. 9, 1983, Ser. No. 530,744

Int. Cl.³ A41G *5/00*; A42B *5/00*

U.S. Cl. 132—53 **2 Claims**



1. A scarf for wear by women undergoing chemotherapy to conceal partial or total baldness, said scarf comprising,

a main outer cloth member for covering the head of the wearer and having a forward edge and rearwardly converging side marginal edges,

a hem formed along the forward edge of said main member, said hem terminating at its ends in ties for tying in a secure manner at the nape of the wearer's neck,

a first fabric closure strip stitched in the underside of said hem,

a second closure strip for removable attachment to said first closure strip,

a hair piece simulating bangs, said hair piece stitched to said second fabric closure strip and projecting forwardly beyond said hem when the scarf is worn to simulate bangs,

an elongate fleeced fabric retention member attached at its ends to said hem at locations oppositely offset from the ends of said first closure strip, said retention member for contact with the wearer's scalp to retain scarf against slipping and further serving to isolate the first closure strip from injurious scalp contact while allowing access to the first closure strip attachment and for hair piece removal purposes,

a fabric filler sheet secured along its forward boundary between said main outer cloth member and said hem and having a rearwardly extending, unattached portion adapted to fully and loosely drape over the wearer's scalp to impart the illusion to a viewer that the scarf outer cloth member is in place over a full head of hair, and

said rearwardly converging side marginal edges of the main outer member each having permanent folds formed therein by stitching each marginal edge at intervals to draw the main outer member of the scarf when worn against the nape of the wearer's neck to fully conceal the scalp.

4,492,243

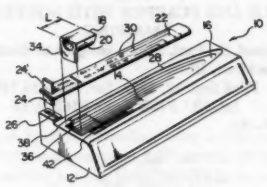
COIN COUNTING AND WRAPPING DEVICE

Robert W. Lombard, 217 - 1350 Stanley Ave., Victoria, British Columbia, Canada (V8S 2S7)

Filed Sep. 27, 1982, Ser. No. 424,603

Int. Cl.³ G07D *9/06*

U.S. Cl. 133—8 A **3 Claims**



1. A coin-counting and wrapping device, comprising:

(a) a base having a coin-receiving trough, said trough sloping downwardly toward a coin-supporting end surface of said trough; and,

(b) a coin-counting arm removably attached to said base and pojecting along an edge of said trough, slightly above said base, to facilitate passage of a sheet of coin-wrapping material between said arm and said base, said arm bearing a scale for counting coins in said trough.

4,492,244

NON-SPILL LIQUID FUEL TANKS

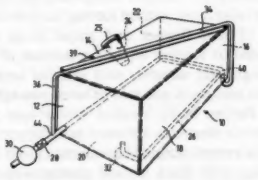
Bryan P. Chinn, Bracknell; John S. Armour, Farnborough; Peter M. F. Watson, Basingstoke, and Graham L. Donne, Bracknell, all of England, assignors to Secretary of State for Her Majesty's Government of the United Kingdom and Britain, London, England

Filed Mar. 28, 1983, Ser. No. 479,847

Claims priority, application United Kingdom, Mar. 29, 1982, 8209227

Int. Cl.³ B65D *25/00*; F16K *17/36, 24/04*

U.S. Cl. 137—38 **6 Claims**



1. A fuel tank comprising, in combination

a top, a bottom and opposite side walls defining a container,

fuel inlet means having a closure,

air vent means comprising a non-return vent arranged to vent said container when in a generally upright attitude,

fuel outlet means comprising a fuel outlet duct extending to circuit said bottom wall of said container,

a first fuel outlet duct vent means, said first fuel outlet duct vent having access to the fuel outlet duct and extending to terminate at a position symmetrically disposed across the bottom wall of the container to the access to the outlet duct, above the highest portion of said top wall, when the container is in an upright attitude, and

a second fuel outlet duct vent means, said second fuel outlet duct vent having access to the fuel outlet duct beneath the termination of the first outlet duct and extending to terminate over the position at which the first outlet duct vent has access to the outlet duct, above the highest portion of said top wall, when the container is in an upright attitude,

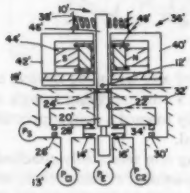
whereby fuel contained in said container is displaced from said fuel outlet duct by air drawn into the fuel outlet duct from the outlet duct vents when said container is tilted from a generally upright attitude, preventing the unwanted escape of fuel from the fuel outlet duct.

4,492,245

NOZZLE AND FLAPPER WITH SQUEEZE FILM DAMPING

John R. Sjolund, St. Paul, Minn., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 18, 1982, Ser. No. 416,738
Int. Cl.³ F15B 5/00; F16F 9/34
U.S. Cl. 137—82 **20 Claims**



15. A squeeze film damper for a hydraulic contol having a pair of opposed flow nozzles directed toward a pivoted control flapper having flattened areas adjacent said nozzles and positioned relative to said nozzles by an electric force motor wherein the flow of fluid through said nozzles is controlled by the distance between said nozzles and said flapper flattened areas to generate a differential pressure upstream of said nozzles, wherein said flapper being straight and having an axis passing through a pivot mounting said flapper, said flapper having an armature section on one side of said pivot forming the armature of said force motor and a flapper section on the opposite side of said pivot, said flapper section being of generally circular cross section except for said flattened areas immediately adjacent said opposed nozzles and exially spaced from said pivot,

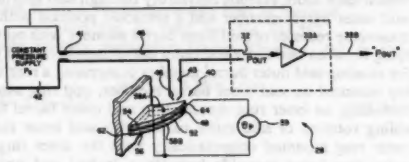
said squeeze film damper comprising an exhaust passageway of circular cross section having an axis coincident with the axis of said flapper and sped from said nozzles and adapted to receive at least a portion of the fluid passing through said nozzles, said nozzles being positioned between said pivot and said exhaust passageway, a portion of said flapper being located within said passageway with sufficient clearance between said flapper and said passageway to permit control movement of said flapper and cooperating with fluid in said passageway to provide fluid damping on said flapper within said passageway, said clearance being of lesser area closer to said pivot and of greater area farther from said pivot, and wherein said portion of said flapper section extends from said flattened areas to a free end of said flapper section opposite said pivot includes fluid passage means to permit passage of the majority of fluid flow from said nozzles through said exhaust passageway.

4,492,246

SOLID STATE CURRENT-TO-PRESSURE AND CURRENT-TO-MOTION TRANSDUCER

Robert C. Prescott, Marshfield, Mass.; Calman Gold, Post Mills, Vt., and Eric V. Anderson, Greenacres, Wash., assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Mar. 28, 1983, Ser. No. 479,460
Int. Cl.³ G05D 16/00
U.S. Cl. 137—85 **11 Claims**



1. Control apparatus, comprising:

a. current sensing means for sensing a current signal and producing a first output signal and for producing a plurality of constant voltages generally independent of the magnitude of said current signal;

b. pressure source means for providing a controlled pneumatic pressure whose magnitude varies in response to a control signal, said pressure source means including:

(1) a supply of gas at a substantially constant pressure,

(2) a conduit having one end in flow communication with said supply and an outlet port at an opposite end,

(3) an exhaust valve in flow communication with said conduit, said valve including a fixed nozzle and an electrically movable flapper element which is adapted to cooperate with said nozzle to throttle the flow of gas through said nozzle in response to said control signal;

c. solid-state pressure sensing means, powered by said current sensing means, for sensing said controlled pneumatic pressure at said outlet port and for providing a second output signal proportional to the magnitude thereof; and

d. amplifier means, responsive to said current sensing means and to said pressure sensing means, for providing a control signal which varies in magnitude with the difference between said first output signal and said second output signal and which is adapted to drive said flapper element to reduce the magnitude of said difference,

whereby a pneumatic pressure is produced at said outlet port which is characteristic of said current signal.

4,492,247

SEQUENCING VALVE

George H. Lockwood, Wilton Manors, Fla., assignor to Anthony Manufacturing Corp., Azusa, Calif.

Filed Feb. 24, 1983, Ser. No. 469,204
Int. Cl.³ F16K 11/00, 31/12
U.S. Cl. 137—119 **35 Claims**

1. A sequencing valve for coupling a fluid from a supply line in sequence to a plurality of outlet conduits, comprising:

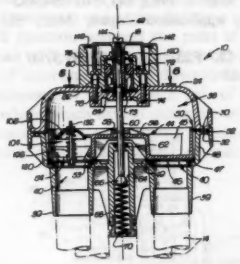
a valve housing having an inlet port for connection to the supply line and a plurality of outlet ports for respective connection to the outlet conduits;

a valve disk within said housing generally between said inlet port and said outlet ports and having a flow opening formed therein;

means for suppporting said valve disk for movement toward a position seated over said outlet ports with said flow opening aligned with one of said outlet ports when the pressure of fluid supplied through said inlet port reaches a predetermined threshold and for movement away from said seated position when the pressure is less than the predetermined threshold, said support means including means for aligning said flow opening in sequence with said

outlet ports upon successive pressure increases to the predetermined threshold; and

a control valve for closing said flow opening unless said valve disk is in said seated position;



said valve disk further having a relatively small bleed port formed therein in a position for alignment with one of said outlet ports other than the outlet port in alignment with said flow opening.

4,492,248

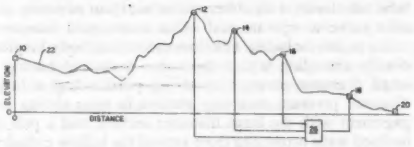
APPARATUS AND METHOD FOR SLACK FLOW ELIMINATION IN A SLURRY PIPELINE

Thomas C. Aude, Orinda, Calif., assignor to Bechtel International Corporation, San Fracisco, Calif.

Division of Ser. No. 899,429, Apr. 24, 1978, Pat. No. 4,230,137. This application Apr. 24, 1980, Ser. No. 143,221

Int. Cl.³ F17D *1/08*

U.S. Cl. 137—236 R **11 Claims**



1. In a pipeline traversing terrain of varying elevations wherein consecutive batches of liquid materials having different specific gravities flow at a substantially constant rate over the length of the pipeline, apparatus for reducing slack flow within said pipeline when an interface between batches passes a relative high point of the pipeline, said apparatus comprising:

means coupled with an interior of the pipeline and located proximate to at least one relative high point of said pipeline for sensing when conditions in the pipeline interior downstream of the high point are such that slack flow may occur; and

means operatively coupled with and responsive to said sensing means for selectively increasing the pressure in the liquid flow downstream of the high point when a slack flow condition occurs.

4,492,249

MOUNTED CHECK VALVE ASSEMBLY

Masao Arino, Higashimatsuyama, and Teruo Koyama, Okazaki, both of Japan, assignors to Jidosha Kiki Co., Ltd., Japan

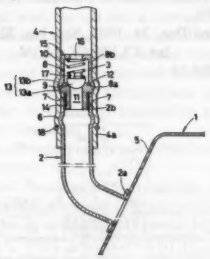
Filed May 18, 1982, Ser. No. 379,318

Claims priority, application Japan, Jun. 3, 1981, 56-81874[U]

Int. Cl.³ F16K *15/00*

U.S. Cl. 137—515 **4 Claims**

1. In a combination with a brake booster having a shell with an opening therein, a mounted check valve assembly comprising, a check valve having a cylindrical body defining an interior passage with a valve seat, a closure member movable in said passage against said seat to close said check valve, biasing means in said passage engaged with said closure member for biasing said closure member against said seat, said cylindrical body having an outer surface with an annular bulge defined around said cylindrical body intermediate a length of said cylindrical body, a pipe securely connected to said shell and around said opening, said pipe having an end portion spaced from said shell, said end portion having an interior with an internal projection extending in said interior, said cylindrical body of said check valve on one side of said annular bulge being threaded and being threadably engaged in said end portion of said pipe and with said internal projection, and a hose



having an end portion extending over a full length of said cylindrical body and onto said end portion of said pipe, said pipe having another annular bulge formed in the end portion to be covered by said end portion of said hose, said annular bulge being circular, said cylindrical body of said check valve comprising a first part carrying said thread and one half of said circular annular bulge in a second part having a cylindrical outer surface and carrying a second half of said circular bulge, said first part defining said valve seat and said second part defining a portion of said passage containing said closure member and said biasing means.

4,492,250

FUEL TANK FOR MOTOR VEHICLES

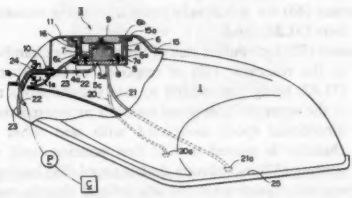
Yoshitaka Ohmori, and Hideaki Nebu, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1983, Ser. No. 486,914

Claims priority, application Japan, Apr. 21, 1982, 57-65399; Apr. 21, 1982, 57-56788[U]; Apr. 22, 1982, 57-66214

Int. Cl.³ F17D *1/02*

U.S. Cl. 137—590 **14 Claims**



1. A fuel tank for motor vehicle of the type in which the rider rides the motor vehicle astride, comprising:

a bottom wall;

a tank body wall which, together with said bottom wall, defines a fuel storing space;

a fuel feed port formed in said tank body wall;

a concave portion formed in said tank body wall;

a fuel cock embedded in said concave portion;

a fuel suction pipe extending from said fuel cock into said fuel storage space; and

a fuel pipe extending from said fuel cock to the engine side of the motor vehicle,

in which said fuel suction pipe and said fuel pipe can be brought into communication and out of communication with each other in the interior of said fuel cock.

4,492,251

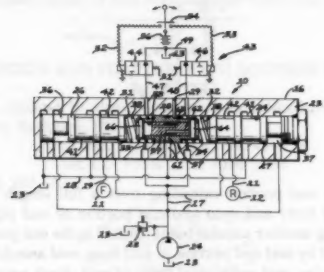
FLUID CONTROL SYSTEM FOR TWO INDEPENDENT ACTUATORS

William W. Blake, Kewanee, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 24, 1981, Ser. No. 334,418

Int. Cl.³ F16K *11/04*

U.S. Cl. 137—596.16 **6 Claims**



1. A fluid control system (10) for selectively controlling actuation of a pair of actuators (11,12) comprising:

a reservoir (13);

a pump connected to the reservoir (13);

a control valve (16) connected to the pump (14) and having a pair of separate directional spools (26,27) slidably positioned therein, and a pair of actuating chambers (31,32) each chamber being disposed at one end of one of the directional spools, respectively (26,27), each of said directional spools being independently movable between a first position at which the pump (14) is in communication with one of the actuators (11,12) and a second position at which said one of the actuators is in communication with the reservoir (13), each of said directional spools being moved to said first position independent of the other directional spool in response to the associated actuating chamber (31,32) being pressurized;

means (43) for selectively pressurizing the actuating chambers (31,32); and

means (57) for venting one of the actuating chambers (31,32) to the reservoir (13) in response to the other chamber (31,32) being pressurized so that simultaneous movement of the separate directional spools is prevented and only the directional spool associated with said other actuating chamber is moved to said first position, said means for venting (57) including a shuttle spool (59) having first and second passageways (62,63) defined therein, said shuttle spool being movable between a first position at which one of the first and second fluid passageways in the shuttle spool communicates one of the actuating chambers (31,32) with the reservoir (13) and a second position at which the other of said first and second passageways in the shuttle spool communicates said other of the actuating chambers (31,32) with the reservoir, said shuttle spool (59) being moved to the first position in response to said other of the actuating chambers (31,32) being pressurized and to said second position in response to said one of the actuating chambers being pressurized.

4,492,252

REVERSIBLE VALVE FOR REVERSIBLE REFRIGERATION CYCLE

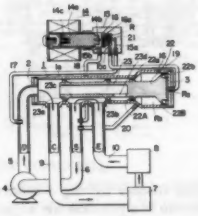
Yoshikazu Kanai, Sayama, Japan, assignor to Kabushiki Kaisha Saginomiya Seisakusho, Tokyo, Japan

Filed Mar. 3, 1982, Ser. No. 354,492

Claims priority, application Japan, Mar. 18, 1981, 56-36788[U]

Int. Cl.³ F25B *13/00*; E03B *3/00*

U.S. Cl. 137—625.43 **7 Claims**



1. A reversible valve for a reversible refrigeration cycle which comprises

a valve body having a small diameter section and a large diameter section;

a delivery tube in communication with a compressor and opening into said small diameter section;

a suction tube in communication with said compressor and opening into said small diameter section;

a pair of tubes in communication with two heat exchangers, respectively, and opening into said small diameter section one on each side of the suction tube;

a one-piece valve means for communicating said suction tube selectively with either one of said pair of tubes; and

a pilot valve to operate said valve means, said one-piece valve means including a hollow cylindrical body longitudinally extending within the valve body and having a small diameter pressure receiving portion and a large diameter pressure receiving portion in snug sliding engagement with the large diameter section, and a pair of inclined walls projecting from around the hollow cylindrical body to seal against the wall of the valve body small diameter section in snug sliding engagement with the small diameter section to define a closed annular chamber around said hollow cylindrical body in cooperation with said small diameter section such that said closed annular chamber communicates the suction tube selectively with either one of said pair of tubes when said cylindrical body is operated.

4,492,253

TIDE GATE VALVE

Spiros G. Raftis, Pittsburgh, Pa., assignor to Red Valve Company, Inc., Carnegie, Pa.

Continuation-in-part of Ser. No. 220,962, Dec. 29, 1980, abandoned. This application Jun. 1, 1982, Ser. No. 384,102

Int. Cl.³ F16K *15/14*

U.S. Cl. 137—849 **4 Claims**

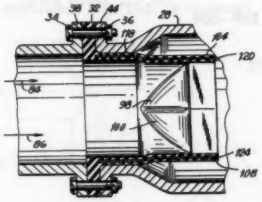
1. An inversion-resistant tide gate valve for large-sized sewage conduits, particularly storm sewer pipes having diameters on the order of 36", 72" and greater, comprising:

(a) a valve body having a flow-through passage for sewage fluids;

(b) a flexible, resilient sleeve elongated along an axis of symmetry and mountable in the valve body in co-axial relationship with the passage, said sleeve having an upstream fluid inlet end region in constant fluid communication with the passage, a downstream fluid outlet end region, and a tapered intermediate region between the inlet and outlet regions,

(i) said tapered region having a plurality of pairs of converging sides circumferentially arranged about the symmetry axis, each pair of converging sides having two side walls which meet at and extend along an inclined crease line that converges at an angle of about 38° relative to the symmetry axis at a a point thereon,

(ii) said downsteam end region having a pair of opposed lips at each junction between the pairs of converging sides, each pair of lips extending in the axial direction from said point of convergence to a downstream end face on the downstream end region, each pair of lips having lateral outer edges which extend along the symmetry axis, all of the lateral outer edges being continuously joined and bounding a fluid-impervious extension of the tapered



region, each pair of lips also having lateral inner edges which are unconnected and discrete and are movable away from each other in response to a pressure head exerted along the downstream direction; and

(c) means for resisting inversion of the sleeve in response to a back-pressure force exerted along the upstream direction, said inversion-resisting means including a plurality of axially-extending reinforcing elements embedded in the sleeve at each pair of opposed lips between the inner and outer edges thereof, the number of reinforcing elements corresponding to the number of pairs of lips, each reinforcing element extending along the respective pair of lips along the upstream, tapered and downstream regions to the downstream end face of the latter.

4,492,254

APPARATUS FOR GUIDING A FLUID MEDIUM DRIVEN WEFT THREAD IN THE SHED OF A WEAVING MACHINE AND USE OF THE APPARATUS AT A MULTIPLE LONGITUDINAL TRAVERSING SHED WEAVING MACHINE

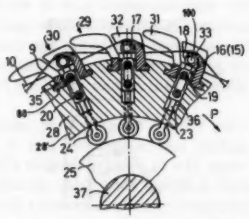
Alois Steiner, Rieden, Switzerland, assignor to Sulzer-Rüti Machinery Works Limited, Rüti, Switzerland

Division of Ser. No. 241,934, Mar. 9, 1981, Pat. No. 4,438,790. This application Jan. 30, 1984, Ser. No. 575,466

Claims priority, application Switzerland, Mar. 27, 1980, 2440/80

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—11 **8 Claims**



1. An apparatus for guiding a fluid-driven weft thread within an open shed of a plurality of open sheds defined in a multiple longitudinal traversing shed weaving machine, comprising:

a weaving rotor provided at its circumference with comb means of shed retaining elements for the warp threads defining the open shed;

two lamellae combs which are provided at said weaving rotor and capable of dipping into and out of the open shed defined by the warp threads;

said two lamellae combs being operatively associated with said comb means of shed retaining elements;

each of said two lamellae combs comprising a predetermined number of elastically structured lamella elements;

each of said lamella having a throughpass opening for guiding an inserted weft thread and a thread outlet opening;

said lamella elements of said two lamellae combs, when assuming an operative position where they are immersed into the open shed being interleaved with one another and forming by means of their throughpass openings a guide channel for the weft thread inserted in a predetermined weft insertion direction;

said guide channel being essentially continuous in the weft insertion direction;

said thread outlet openings of said lamellae elements, when in their operative position, being sealed and said guide channel also being continuously closed in radial direction; and

stop means operatively associated with said elastically structured lamella elements in order to close said thread outlet openings during interleaving of said lamella elements of said two lamellae combs.

4,492,255

APPARATUS FOR GUIDING A FLUID MEDIUM DRIVEN WEFT THREAD IN THE SHED OF A WEAVING MACHINE AND USE OF THE APPARATUS AT A MULTIPLE LONGITUDINAL TRAVERSING SHED WEAVING MACHINE

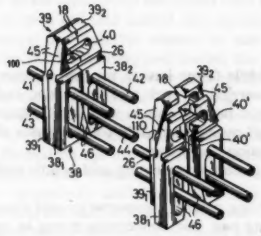
Alois Steiner, Rieden, Switzerland, assignor to Sulzer-Rüti Machinery Works Limited, Rüti, Switzerland

Division of Ser. No. 241,934, Mar. 9, 1981, Pat. No. 4,438,790. This application Jan. 30, 1984, Ser. No. 575,467

Claims priority, application Switzerland, Mar. 27, 1980, 2440/80

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—11 **14 Claims**



1. An apparatus for guiding a weft thread within the shed of a weaving machine and which is driven by a flowing fluid medium, comprising:

two lamellae combs which are capable of dipping into and out of the shed and between warp threads thereof;

each of said two lamellae combs comprising a predetermined number of lamella elements;

said lamella elements of said two lamellae combs being alternatingly arranged across the width of the weaving machine;

each said lamella element having a throughpass opening for guiding an inserted weft thread and a thread outlet opening;

each said lamella element being divided along a predetermined dividing plane into two lamella segments;

each said lamella segment being provided with a cut-out extending from said dividing plane;

means for moving said two lamellae combs between an operative position, in which the lamella elements are dipped into the shed, and an inoperative position, in which the lamella elements are dipped out of the shed;

said lamella elements, in the operative position of the two lamella combs, contacting each other and said lamella segments of each said lamella element contacting each other at the related dividing plane such that said thread outlet opening of each lamella element is closed and said cut-outs of the two lamella segments of each lamella element complement each other and define the throughpass opening, and forming, by means of their throughpass openings, a guide channel for weft insertion in a predetermined weft insertion direction;

said guide channel being essentially continuous in said weft insertion direction and being continuously closed in radial direction; and

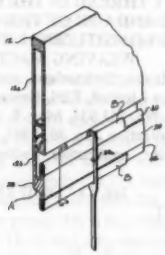
said lamella segments of said lamella elements, in the inoperative position of said two lamellae combs, being spread apart at said dividing plane such that said thread outlet openings are open.

4,492,256

EXTRUDED HEDDLE ROD AND CAP

Charles F. Kramer, Greenville, S.C., assignor to Steel Heddle Manufacturing Company, Greenville, S.C.

Filed Jun. 30, 1982, Ser. No. 393,635
Int. Cl.³ D03D 9/00
U.S. Cl. 139—92 **9 Claims**



1. In a heddle frame having top and bottom frame slats, a heddle rod carried by each said frame slat, and heddles supported on said heddle rods in said heddle frame having end slots received over said heddle rods, a frame slat and heddle rod construction comprising:

connecting means connecting said heddle rod to said frame slat;

a web portion carried transverse to said connecting means extending past said connecting means in opposing directions;

a web portion having a rear planar surface and a forward planar surface opposite said rear planar surface defining a predetermined thickness therebetween;

said web portion extending transversely past said connector means terminating in remote free ends having outer free edges;

cap means having spaced legs carried on said free ends of said web portion covering said outer free edges and wrapping around said outer free edges to form rear and forward wear surfaces having a generally parallel relationship with said rear and forward planar surfaces of said web portion of said heddle rod; and

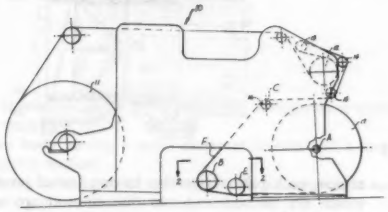
said legs of said cap means and said free ends of said heddle rod having a total thickness greater than said web portion so that said rear and forward wear surfaces project beyond said rear and forward planar surfaces of said web portion so that opposing interior surfaces of said heddle eye slot contact said wear surfaces and are held thereby generally out of contact from said rear and forward planar surfaces of said web portion of said heddle rod.

4,492,257

ON LOOM CLOTH TAKEUP WITH OSCILLATING GUIDE ROLL

William J. Alexander, III, 41 W. Golden Strip Dr., Mauldin, S.C. 29662

Filed Dec. 30, 1982, Ser. No. 454,703
The portion of the term of this patent subsequent to Jun. 28, 2000, has been disclaimed.
Int. Cl.³ D03D 49/20
U.S. Cl. 139—304 **5 Claims**



1. In a loom having a driven cloth takeup roll carried on the loom, an oscillating guide over which cloth passes on the way to said takeup roll comprising:

guide means directing cloth manufactured on the loom rearwardly above the cloth roll;

a guide roll receiving said cloth from said guide means;

means mounting said guide roll for oscillatory movement longitudinally thereof;

drive means imparting oscillatory movement to said guide roll; and

means carrying said cloth roll for center winding of the cloth delivered from said guide roll;

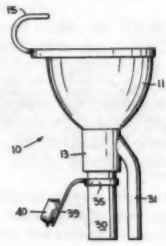
whereby the edges of the cloth are moved from side to side during the build of the cloth roll sufficiently to avoid alignment of the edges.

4,492,258

STERILE URINE SPECIMEN COLLECTION

Joseph Lichtenstein, Colonia, and Vincent Vaillancourt, Livingston, both of N.J., assignors to Whitman Medical Corporation, Clark, N.J.

Filed Feb. 18, 1983, Ser. No. 467,904
Int. Cl.³ B65B 3/04
U.S. Cl. 141—1 **37 Claims**



36. A method for collecting a midstream specimen of void urine comprising the steps of:

collecting a forestream portion of void urine in a chamber disposed partially in a midstream collection container;

retaining the collected forestream portion in said chamber while overflowing a subsequent midstream portion of the void urine into said container; and

draining urine which overflows said container.

4,492,259

APPARATUS FOR FILLING BOTTLES

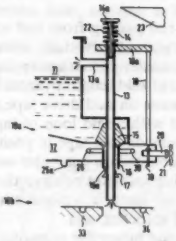
Peter Sick, Ahlenbachweg 21a, D-7804 Glottertal, Fed. Rep. of Germany, and Joseph Menini, Selencourt, France, assignors to Peter Sick, Glottertal, Fed. Rep. of Germany

Filed May 2, 1983, Ser. No. 490,371

Claims priority, application Fed. Rep. of Germany, May 7, 1982, 3217271

Int. Cl.³ B65B 1/30

U.S. Cl. 141—198 **10 Claims**



1. Apparatus for filling bottles with liquid to a predetermined height comprising:

a work station including an upper section and a lower section, said upper section including a generally upstanding suction pipe, a liquid tank adapted for connection to a vacuum source and having an upper space in communication with said pipe, and a control assembly,

said lower section including a centering chuck having bottle top receiving and centering structure defining a central opening,

said lower section being relatively upwardly and downwardly movable toward and away from said upper section between an initial bottle loading and unloading position and a bottle filling position proximal said upper section in response to the movement of a bottle to be filled toward and away from said filling position with its mouth in said structure and in alignment with said opening, said suction pipe on the upper section being disposed in longitudinal alignment with said opening in the structure,

said control assembly including a pipe segment disposed in surrounding relationship to said suction pipe to present an annular duct space therebetween, and atmospheric air and inert gas ducts in fluid communication with said duct space, said duct space also being in communication with said liquid tank and disposed in alignment with said opening for communicating with the opening and the bottle mouth when the lower section is in its bottle filling position,

said pipe segment presenting an annular valve seat at the upper end of said duct space, said suction pipe being longitudinally shiftable relative to said upper section and having an annular valve body mounted thereon in alignment with said valve seat, whereby longitudinal shifting of said suction pipe opens and closes said valve to correspondingly cause and interrupt the communication between the space and the liquid tank.

4,492,260

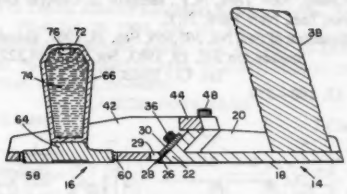
WOODWORKING PLANE

Carl Whiteford, 3 High Point Rd., Westport, Conn. 06880

Filed Apr. 14, 1983, Ser. No. 484,906

Int. Cl.³ B27G 17/02

U.S. Cl. 145—5 R **2 Claims**



1. A plane for straightening and smoothing surfaces of wood and the like comprising:

A. an elongate body member having forward and rearward sections,

B. handle means affixed to said body member adjacent said forward and rearward sections for moving said body member along a piece of material being cut,

C. a cutting blade mounted in said rearward section of said body member,

D. a sole plate as part of said body member, said sole plate defining a planar bearing surface on which said body member slides across the material being planed, said sole plate having

(1) a rearward section which extends from said cutting blade toward said rearward end of said body member and which has a fixed position relative to said bosy member, and

(2) a forward section which extends from said cutting blade toward said forward end of said body member, said forward section of said sole plate comprising a peripheral frame section which is fixed relative to said rearward section of said sole plate and which defines an opening therein and a central disc member carried by said peripheral frame section within said opening,

E. means mounting a portion of said forward section of said sole plate for limited movement relative to said rearward section of said sole plate in a direction perpendicular to the plane of said bearing surface, said means comprising connection means operatively associated with said peripheral frame section and said central disc member for moving said central disc member relative to said peripheral frame section and for holding said central disc member in a pre-selected position relative to said peripheral frame section, said connecting means comprising

(1) female screw threads formed on the interior annular surface of said opening and complimentary male threads formed on the exterior circumferential surface of said central disc member, and

(2) means operatively associated with said peripheral frame section and said central disc member for restraining relative rotary movement between said peripheral frame section and said central disc member, said means comprising a plurality of arcuately elongate resilient fingers formed in said peripheral frame section adjacent said opening, said female threads being formed only on said resilient fingers, the diametral distance between opposed resilient fingers in the unstressed position thereof being slightly less than the diameter of said central disc member, whereby upon engagement of said central disc member with said peripheral frame section said resilient fingers flex slightly and engage said central disc member with high frictional resistence to relative movement, and

F. means for adjustably moving said portion of said forward section of said sole plate in order to adjust the depth of the

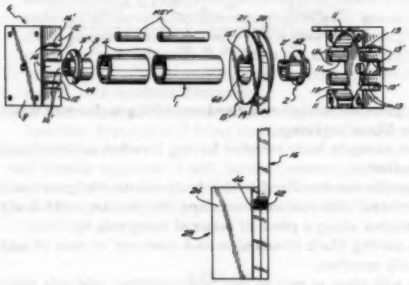
cut made by said plane during movement thereof across the material being planed.

4,492,261

SHADING SYSTEM

Ian Chong, New York, N.Y., assignor to General Drapery Services, Inc., New York, N.Y.

Continuation of Ser. No. 305,869, Sep. 28, 1981, abandoned. This application Jul. 19, 1983, Ser. No. 515,322
Int. Cl.³ E06B 9/20
U.S. Cl. 160—319 5 Claims



1. A shading system comprising:
(a) a shade;
(b) a strap or cord for winding and unwinding said shade;
(c) a hub, said strap or cord being wound about said hub at an end opposite said shade;
(d) a coil spring, said coil spring being wound about said hub coaxially with said strap or cord, the outer end of said coil spring being stationary, the inner end of said coil spring being affixed to said hub, so that said coil spring winds or unwinds from its center as said hub turns;
(e) a roller or tube, said roller or tube supporting said shade as it hangs, with said strap or cord being wound around said roller or tube at its end opposite said hub;
(f) a hollow pulley, said roller or tube being inserted through said pulley, said strap or cord being wound around said pulley at the end opposite said hub;
(g) a pivotal grip for engaging said strap or cord between said pulley and said hub, to secure said strap or cord against movement, thereby maintaining said shade at a certain height;
(h) a pair of supports for said roller or tube, each of said supports being at one of the ends of said roller or tube and supporting said roller or tube, each of said end supports being provided with a series of slots through which said shade wound around said roller or tube passes, to allow said shade to hang in a direction other than directly down from said roller or tube; and
(i) a key, said roller or tube being provided with a keyway at an end of said shade for receiving said key, as said shade is wound around said roller or tube.

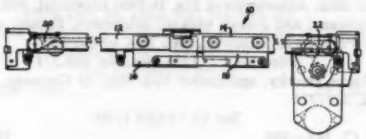
4,492,262

ADJUSTABLE TRAVERSE ROD AND MOTOR DRIVE COMBINATION

Paul E. Comeau, Warwick, R.I., assignor to Kenney Manufacturing Company, Warwick, R.I.

Filed May 7, 1982, Ser. No. 376,203
Int. Cl.³ A47H 1/00
U.S. Cl. 160—126 3 Claims

1. A drapery traverse rod and motor drive combination comprising:
(a) a pair of telescoping semi-tubular members forming a curtain rod,
(b) a pair of wall brackets,
(c) means at the outer ends of said rod for mounting said rod on said brackets,
(d) a drive motor,
(e) means for mounting said drive motor on one of said brackets,
(f) a pair of master carriers mounted in said rod for sliding motion, longitudinally of said rod,
(g) a flexible drive tape,
(h) pulley means within one outer end of said rod for receiving and guiding said tape,
(i) a length of said drive tape with both ends releasably secured to one of said master carriers to form an endless



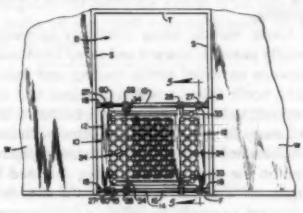
loop within said rod passing from end to end of said rod around said pulleys, said drive tape releasably secured to the other of said master carriers at an intermediate point between the ends of said length of tape,
(j) positive drive means on said drive tape,
(k) a drive sprocket within said loop of tape engaging said positive drive means on said tape in positive driving relation, and means mounted on one outer end of said rod for retaining said drive sprocket relative thereto but free to slide within narrow limits in a plane normal to the rotational axis of said sprocket, and
(l) a drive shaft on said motor for engaging, and supporting said drive sprocket in driving relation to said tape.

4,492,263

INFANT SECURITY DOOR GATE ASSEMBLY

Albert W. Gebhard, Denver, Colo., assignor to Gerico, Inc., Denver, Colo.

Continuation of Ser. No. 283,044, Jul. 13, 1981, abandoned. This application Aug. 30, 1983, Ser. No. 527,777
Int. Cl.³ E06B 3/12
U.S. Cl. 160—228 6 Claims



1. A releasable closure adaptable for disposition between spaced, confronting sides of an area way comprising:
a pair of panels arranged in parallel, substantially overlapping relation to one another, and
supporting means for said panels including upper and lower common support bars traversing the upper and lower edges of said panels and to which said panels are secured, sleeve members disposed at upper and lower corners of said pair of panels for insertion of said support bars therethrough, at least one of said sleeve members on one panel being positively connected to one of said support bars, said support bar being fixed against rotation within said one sleeve, and said sleeve members on the other of said panels being slidable with respect to said support bars, said support bars being journaled for rotation therein, each of

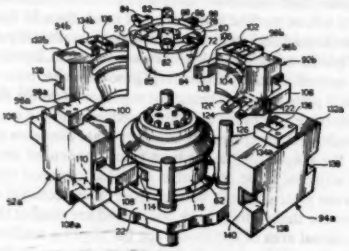
said support bars including telescoping tubular sections having side-engaging means at opposite ends thereof, and threaded adjustment means between each of said telescoping tubular sections for rotating one of said tubular sections to vary the effective length of said support bars, said threaded adjustment means having spring-loading means associated therewith to yieldingly urge said telescoping sections of each support bar in an outward direction forcing said side-engaging ends into engagement with the sides of said area way, and panel expansion means associated with said one of said tubular sections comprising locking collar means engageable with said one of said sleeve members on said other of said panels to cause said panel to resist sliding movement in an inward direction and to follow the movement of said one tubular section in said outward direction.

4,492,264

CENTRIFUGAL CASTING DEVICE

Roberto Gaddi, Torino, Italy, assignor to Fataluminium S.p.A., Torino, Italy

Filed Jun. 23, 1982, Ser. No. 391,423
Claims priority, application Italy, Jul. 6, 1981, 67939 A/81
Int. Cl.³ B22D *13/04, 13/10*
U.S. Cl. 164—292 **17 Claims**



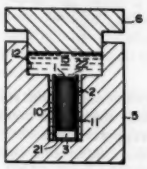
1. In a device for the centrifugal chill-casting of light alloy parts substantially in the form of a body of revolution, such as motor vehicle wheels, of the type in which a chill mold comprising several elements which fit together to define a casting cavity of a shape corresponding to that of the part, and are separable for removal of the part, is mounted on a support which can be rotated about the vertical axis of the casting cavity, and has an upper coaxial pouring opening for pouring molten metal into the mold, the improvement wherein the chill mold comprises a lower element for defining the lower part of the cavity, an upper element for defining the upper part of the cavity and including the pouring opening, and four peripheral elements located in two opposing pairs, which together are able to define the cavity peripherally, the lower element occupying a casting position on the support coaxial therewith, the upper element being movable between a casting position in which it overlies the lower element coaxially and a shakeout position in which it does not interfere with the upward removal of the part from the mold, and the peripheral elements being individually displaceable radially on the support to enable them to be moved from a casting position, in which they together surround the upper and lower elements, to a shakeout position in which they are further removed from the axis of rotation, and wherein the elements of the chill mold are provided with locking means which are mutually engageable due to the movement of a first pair of the opposed pheripheral elements towards their respective casting positions when the lower and upper elements and the opposed peripheral elements of the other pair are substantially in their respective casting positions and means being provided for locking the peripheral elements of the first pair in their respective casting positions.

4,492,265

METHOD FOR PRODUCTION OF COMPOSITE MATERIAL USING PREHEATING OF REINFORCING MATERIAL

Tadashi Donomoto, and Atsuo Tanaka, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 29, 1981, Ser. No. 288,004
Claims priority, application Japan, Aug. 4, 1980, 55-107040; Mar. 6, 1981, 56-32289; Mar. 26, 1981, 56-44847; Mar. 26, 1981, 56-44848; Mar. 26, 1981, 56-44849
Int. Cl.³ B22D *19/14, 18/02*
U.S. Cl. 164—493 **3 Claims**



1. A method of producing a composite material from reinforcing material and molten matrix metal, said reinforcing material being an assembly of parallely arranged linear fibers, comprising the steps, performed in the specific order, of:

(a) charging linear fibers of substantially the same length as parallelly arranged in a tubular case closed at one axial end thereof to form a bundle of said linear fibers while leaving a substantial empty space in said tubular case adjacent the closed axial end thereof;

(b) heating said bundle of said linear fibers to a temperature substantially above the melting point of said matrix metal;

(c) placing said tubular case with said heated bundle of said linear fibers charged therein in a cavity of a pressurizing type casting mold having a pressure plunger in such a manner that only one of opposite axial ends of said bundle of said linear fibers is directly exposed to the space of said cavity while the other of the opposite axial ends and an annular outer side surface of said bundle of said linear fibers is substantially isolated from the space of said cavity;

(d) pouring said matrix metal in molten condition into said cavity so as to submerge said tubular case with said heated bundle of said linear fibers charged therein totally in a molten bath of said matrix metal received in said cavity with said one axial end of said bundle of said linear fibers directly open to said cavity space being directly exposed to the body of said molten bath of said matrix metal while said other axial end and said annular outer side surface of said bundle of said linear fibers are substantially isolated from direct exposure to the body of said molten bath of said matrix metal;

(e) applying a substantial pressure to said molten bath of said matrix metal by driving said pressure plunger so as to infiltrate said molten matrix metal into spaces left among and around said linear fibers in said tubular case in the axial direction of said bundle of said linear fibers; and

(f) cooling said molten bath of said matrix metal with said bundle of said linear fibers submerged therein and infiltrated with said molten matrix metal down to a temperature below the melting point of said matrix metal while maintaining said pressure.

4,492,266

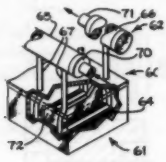
MANIFOLDED EVAPORATOR FOR PUMP-ASSISTED HEAT PIPE

Gary D. Bizzell, Los Altos, and William F. Ekern, Sunnyvale, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Division of Ser. No. 313,737, Oct. 22, 1981, Pat. No. 4,470,450. This application Dec. 22, 1983, Ser. No. 564,410

Int. Cl.³ F28D *15/00*

U.S. Cl. 165—104.26 **16 Claims**



1. A heat absorption component for a closed-loop heat transfer system, said heat absorption component comprising:

(a) a hollow evaporation chamber, an exterior portion of a first wall of said evaporation chamber being configured to intercept heat flux from a heat source, said evaporation chamber having an outlet means for exit therefrom of working fluid in vapor phase, said evaporation chamber also having a wick structure positioned adjacent an interior portion of said first wall;

(b) a supply plenum outside said evaporation chamber;

(c) a recovery plenum outside said evaporation chamber;

(d) a plurality of delivery conduits extending from said supply plenum to said recovery plenum for transporting working fluid in liquid phase from said supply plenum to said recovery plenum, a portion of each of said delivery conduits passing through said evaporation chamber, a segment of said portion of each delivery conduit inside said evaporation chamber being positioned adjacent said wick structure, said delivery conduit segment adjacent said wick structure having an aperture through which working fluid in liquid phase can flow from said delivery conduit into said wick structure, a constant supply of said working fluid in liquid phase thereby being provided adjacent said first wall to absorb heat from said first wall by evaporation.

4,492,267

WATER BOX AND EXPANSION CHAMBER DEVICE FOR A HEAT EXCHANGER

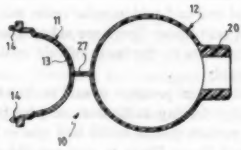
Patrick Cadars, Montigny, France, assignor to Valeo, Paris, France

Filed Feb. 1, 1982, Ser. No. 344,757

Claims priority, application France, Feb. 12, 1981, 81 02764

Int. Cl.³ F01P *11/02*

U.S. Cl. 165—104.32 **13 Claims**



1. In a heat exchanger comprising a water box and an expansion chamber, a sub-assembly comprising at least part of the wall of the water box and at least part of the wall of the expansion chamber, said at least parts of the walls comprising a plastic material being formed in a single piece and being of a cross-section adapted to resist deformation caused by changes in pressure inside the water box and expansion chamber being of substantially circular or semi-circular cross-section, wherein the parts of the walls comprised by said sub-assembly are external to each other such that the water box and expansion chamber substantially do not contain a wall which is liquid-contacting on both sides.

4,492,268

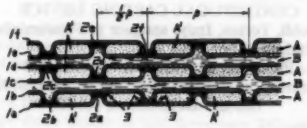
CONDENSER

Haruo Uehara, Saga, and Hiroyuki Sumitomo, Osaka, both of Japan, assignors to Hisaka Works, Ltd., Osaka, Japan

Continuation of Ser. No. 76,443, Sep. 17, 1979, abandoned. This application Aug. 24, 1981, Ser. No. 295,309

Int. Cl.³ F28F *3/00*

U.S. Cl. 165—166 **1 Claim**



1. A plate-type condenser adapted to handle organic working fluids whose surface tension is not more than 35 dyne/cm as gas mediums to be condensed comprising a plurality of heat transfer plates each of which consists substantially of transversely spaced vertially extending grooves with intervening ridges, said plate elements being put together to define therebetween alternate spaces for a cooling medium and for a medium to be condensed, the ridges of adjacent plate elements extending into the spaces for the medium to be condensed and abutting the adjacent plate element in between opposed ridges of the adjacent plate element, whereby the cross-sectional area of the spaces for the medium to be condensed are smaller than the cross-sectional area of the spaces for the cooling medium, and in which the space vertically extending grooves in the condensing areas have a pitch and depth of 1–2 mm and 0.3 to 0.6 mm respectively.

4,492,269

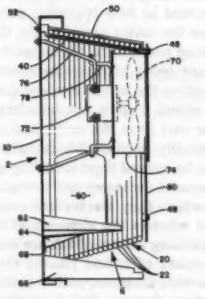
TUBE SUPPORT ASSEMBLY FOR A HEAT EXCHANGER

William B. Jennings, Collierville, Tenn.; Robert M. Kozlowski, Syracuse, and Richmond S. Hayes, Jr., Fayetteville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 17, 1982, Ser. No. 450,705

Int. Cl.³ F28F *9/00*; F28D *1/04, 7/04*; F25B *39/04*

U.S. Cl. 165—172 **5 Claims**



1. A heat exchanger assembly which comprises:

a heat exchanger formed from a plurality of loops of wound

fin tubing including a projecting fin material extending from a base tube, said loops being located in a circumferentially extending pattern wherein adjacent loops are displaced relative to each other to provide a tapered configuration; and

at least one tube support assembly for securing the loops in the tapered configuration including a support member having a partition end portion and an orifice end portion with tube securing portions therebetween which define tube receiving openings for the receipt of the individual loops of tubing, at least one extension portion projecting at a non-perpendicular angle beyond the tube securing portion and defining a rod slot, another extension portion projecting perpendicular to and beyond said tube securing portion, a rod having a body portion extending the length of the support member and being sized to only snap fit and be secured within the rod slot of the extension portion and having a threaded portion located at an angle to said body portion and coacting with said partition end portion and said another extension portion, said rod securing the loops of tubing in the tube receiving openings by engaging the loops between the rod and the support member.

4,492,270

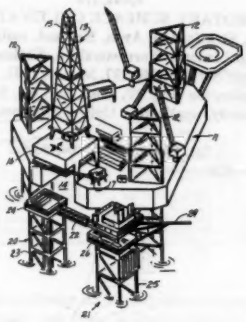
METHOD OF INSTALLING AND USING OFFSHORE WELL DEVELOPMENT AND PRODUCTION PLATFORMS

Edward E. Horton, Rancho Palos Verdes, Calif., assignor to Global Marine, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 146,360, May 2, 1980, abandoned. This application Apr. 6, 1981, Ser. No. 251,112

Int. Cl.³ E02B *17/02*; E21B *43/01*

U.S. Cl. 166—358 **9 Claims**



1. A method for installing and using an offshore well development platform in water having a depth suitable for use of jack-up drilling platforms, the method comprising the steps of:

(a) providing a jack-up drilling platform having thereon:

(1) a drilling rig having an operative position in a drilling operations area outboard of an elevatable base of the jack-up platform; and

(2) a crane on the elevatable base adjacent the perimeter of the base and proximate the drilling rig operative position;

(b) positioning the jack-up platform at an offshore location with the base thereof elevated above the water surface so that the drilling operations area is located vertically over a submerged location on the sea floor at which at least one subsea oil or gas well is to be drilled;

(c) thereafter moving to the offshore location a prefabricated well protector jacket assembly having a length sufficient to extend from the submerged location to above the water surface thereabove, such length being insufficient to extend to the elevation of the drilling rig when the drilling rig is in its operative position;

(d) thereafter setting the well protector jacket assembly in an erect attitude on the sea floor over the submerged location;

(e) thereafter securing the sea jacket assembly to the sea floor over the submerged location by use at least in part, of the jack-up platform;

(f) moving to the site of the secured jacket assembly a prefabricated development wellhead deck assembly matable with the upper end of the secured jacket assembly;

(g) thereafter mating the wellhead deck assembly securely to the jacket assembly below the operative position of the drilling rig, thus to define independently of the jack-up platform a completed development wellhead platform above the water surface and below the operative position of the drilling rig;

(h) thereafter using the drilling rig in its operative position to drill and complete through the wellhead platform at least one well into the sea floor;

(i) at a desired time after performance of step (b) above, moving to the offshore location adjacent the jack-up platform a prefabricated production platform leg assembly having a length substantially equal to that of the well protector jacket assembly;

(j) thereafter, at a desired time after performance of step (e) above, setting the leg assembly in an erect attitude on the sea floor adjacent the secured jacket assembly;

(k) thereafter, securing the leg assembly to the sea floor by use, at least in part, of the jack-up platform;

(l) thereafter, moving to the site of the secured leg assembly a completed prefabricated production platform deck assembly matable with the upper end of the secured leg assembly; and

(m) thereafter, mating the production platform deck assembly securely to the production leg platform assembly to define a complete production platform.

4,492,271

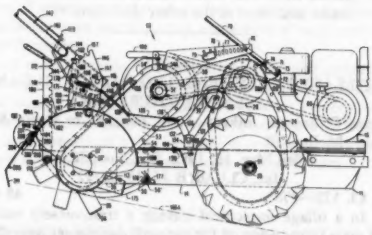
TINE TILLER WITH TINES AND WHEELS EACH ROTATABLE IN EITHER DIRECTION

Charles W. Doering, New Albany, Ind., assignor to Brinly-Hardy Co., Inc., Louisville, Ky.

Filed Jul. 12, 1982, Ser. No. 397,479

Int. Cl.³ A01B *33/00*

U.S. Cl. 172—43 **6 Claims**



4. A tine tiller including:

a frame;

wheel means rotatably supported by said frame;

first rotating means to cause rotation of said wheel means in either direction to advance said frame in either direction;

tine assembly means supported by said frame, said tine assembly means including a plurality of rotatably mounted tines for engaging soil to be tilled;

second rotating means to cause rotation of said tines in either direction irrespective of the direction of rotation of said wheel means;

said tine assembly means including:

a shaft rotatably supported by said frame;

means to connect each of said tines to said shaft for rotation therewith;

each of said tines having a cutting edge on opposite sides

thereof so that one of said cutting edges engages the soil to till the soil when said second rotating means rotates said tines in one direction with each of said tines in a first tilling position and the other of said cutting edges engages the soil to till the soil when said second rotating means rotates said tines in the other direction with each of said tines in a second tilling position;

and control means to control the tilling position of each of said tines during rotation in each direction;

said connecting means including:

two pairs of plates mounted on each side of said frame and connected to said shaft;

each of said plates having a circular periphery and being of the same diameter;

a plurality of pivotal mounting means supported by said plates at the same radial distance from the center of said shaft and at equally angular spaced distances from each other;

and each of said pivotal mounting means having one of said tines pivotally mounted thereon for movement between the first tilling position of each of said tines during rotation in one direction and the second tilling position of each of said tines during rotation in the other direction;

said control means including:

a plurality of stop means supported by said plates at the same radial distance from the center of said shaft at equally angularly spaced distances from each other, each of said tines engaging one of said stop means in each of its tilling positions;

and an annular member mounted on said shaft and formed of a resilient material to engage each of said tines in each of its first and second tilling positions when each of said tines is engaging one of said stop means;

motive means;

said first rotating means including connecting means to connect said motive means to said wheel means;

a first shaft driven at a speed having a constant ratio to the speed of said motive means;

and said second rotating means including:

first means mounted on said first shaft for axial movement between first and second positions;

and second means cooperating with said first means when said first means is in its first position to rotate said tines in the one direction and cooperating with said first means when said first means is in its second position to rotate said tines in the other direction.

4,492,272

TILLAGE IMPLEMENT AND IMPROVED GANG ASSEMBLY THEREFOR

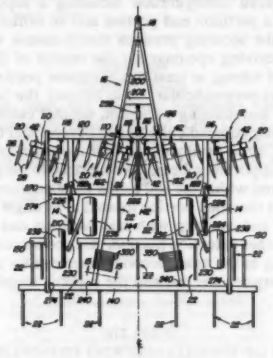
Thomas C. Jensen, Ankeny, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 15, 1982, Ser. No. 358,121

Int. Cl.³ A01B *35/18, 63/22*

U.S. Cl. 172—178 **45 Claims**

1. In a tillage implement having a transversely extending rigid main frame adapted for forward movement over the soil, a plurality of rearwardly located earth-working tools supported from the main frame, means for moving the frame vertically to vary the depth of penetration of the tools over a substantial preselected range, and a trash-sizing gang assembly supported forwardly of the earth-working tools comprising: a transversely extending gang tube, a standard having an upper end connected to the gang tube and a lower end extending generally downwardly and rearwardly from the gang tube, a gang of cutter blades rotatably mounted at the lower end of the standard, and bracket means rockably connecting the gang tube to the main frame for supporting the gang of cutter blades generally transverse to the forward direction and permitting the gang to rock vertically below the main frame over a working range of distance approximately equal to that of the preselected range, and wherein said bracket means includes a fore-and-aft extending arm member, a first pivot connecting the forward end of the member to the frame, an upwardly and rearwardly directed member fixed to the frame and including a downwardly and forwardly directed spring-abutting surface located rearwardly of and above the aft end of the arm member, a spring compressed between the spring-abutting surface



and the aft end of the arm member and acting through a moment arm which decreases as the arm rocks upwardly to compress the spring for automatically maintaining a substantially constant down pressure of the gang against the soil as the gang rocks vertically over the entire working range.

4,492,273

ROTARY SURFACE CULTIVATOR

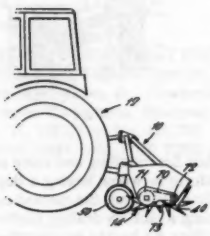
John V. Fox, Stratford on Avon, England, assignor to Bomford & Evershed Limited, Worcestershire, England

Continuation of Ser. No. 240,397, Mar. 4, 1981, abandoned. This application Aug. 19, 1983, Ser. No. 524,673

Claims priority, application United Kingdom, Mar. 11, 1980, 8008145

Int. Cl.³ A01B *21/04, 33/02*

U.S. Cl. 172—520 **2 Claims**



1. A soil surface cultivating machine comprising a first forward horizontally elongate rotor shaft having a plurality of axially spaced mounting means thereon, a plurality of tines each having one end removably secured to said means, each tine having a flat spade end portion, the tines being positioned on said rotor so that the spade end portions are positioned generally tangentially of the underside of the rotor shaft when the tines extend forwardly to enter the ground and rotate in the same direction as the intended forward direction of the movement of the machine for engaging and lifting the soil surface, the rotor being arranged to extend across the machine with the tines arranged along the length of the rotor, means to mount said rotor for rotation about an axis substantially tranverse to the intended direction of movement of the machine with the tines penetrating the ground, a second rearwardly positioned

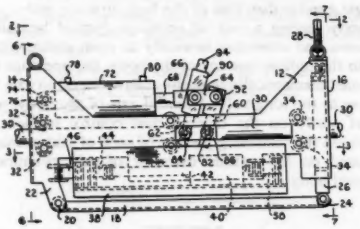
rotor shaft having a plurality of axially spaced mounting means thereon and a plurality of tines each having a flat spade end portion, the tines of the second rotor being removably fixed to said mounting means so that the spade portions thereof are positioned generally tangentially of the underside of the second rotor shaft when the tines extend to the rear and enter the ground in the opposite sense to the tines of the first rotor in soil lifting and working contact with the ground, the axes of the rotors being parallel and spaced apart such that the tines of one rotor pass between the tines of the other rotor, the second rotor being drivingly connected to the first rotor so as to rotate at a faster speed than the first rotor and to rotate in the same direction as the wheels of a vehicle when driving the machine, the speeds of rotation of the first and second rotors being directly proportional and in the ratio of between 1:2 and 1:4.

4,492,274

LIGHT WEIGHT UNDERGROUND PIPE OR CABLE INSTALLING DEVICE

William O. Schoeck, North Fort Myers, Fla., assignor to Elephant Industries, Inc., North Fort Myers, Fla.

Filed Aug. 2, 1982, Ser. No. 404,390
Int. Cl.³ E21B 7/26
U.S. Cl. 175—19 **1 Claim**



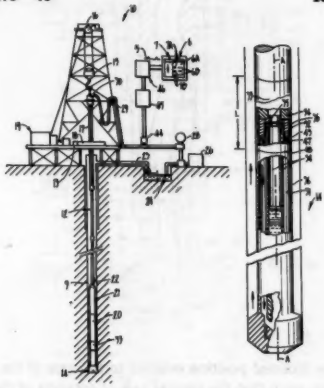
1. An underground pipe installer device adapted to be positioned in a narrow and deep operating trench and having reciprocating drive jaws to tightly engage an actuating rod consisting of a plurality of rigid rod sections coupled in end to end arrangement and to move said actuating rod longitudinally to form an underground hole between two spaced points comprising a rectangular framework having closely spaced apart side plates connected by front and rear end plates, front and rear guide rollers for the actuating rod, laterally movable elongated gates positioned adjacent the bottom of the framework beneath the guide rollers for the actuating rod and adapted in a retracted position to lie parallel and substantially flush with the side plates, and in an extended position to project outwardly from the parallel to the side plates to engage the walls of the narrow and deep operating trench beneath the actuating rod to clamp the pipe installer device in the trench, fluid pressure operated means to actuate the gates, a support plate hingedly mounted relative to the framework to vary the angular inclination of the actuating rod, drive jaws to engage the actuating rod, said drive jaws being positioned above the actuating rod, and fluid pressure operated means positioned above the actuating rod to actuate the drive jaws and to project the actuating rod longitudinally between said two spaced points.

4,492,275

MEANS AND METHOD FOR FACILITATING MEASUREMENTS WHILE CORING

Frank L. Campbell, Santa Ana; Dean C. Barnum, Fullerton, and William C. Corea, Placentia, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 12, 1983, Ser. No. 522,922
Int. Cl.³ E21B 47/09
U.S. Cl. 175—46 **18 Claims**



1. Apparatus for monitoring detrimental conditions associated with extraction of a core from an earth formation penetrated by a well bore using a core barrel having a rotatable outer cylindrical barrel attached to and operationally rotated by, a drill string, and drilling fluid circulating within said well bore as said core is extracted, wherein rotation of a usually stationary inner core barrel coaxial of the outer core barrel during said extraction of said core and its placement thereof within the cylindrical inner barrel, is used to indicate said associated detrimental coring conditions, comprising;

first means mechanically attached to said core barrel and operationally fitted between said outer and inner core barrels for generating a series of electrical signals indicative of relative rotation of the inner core barrel relative to the outer core barrel during extraction of said core from the formation;

second means uphole from said first means and operational connected thereto for responding to said series of electrical signals indicative of said relative inner barrel rotation wherein occurrence o said relative inner barrel rotation, causes operations to be initiated to overcome any associated detrimental condition within said well bore.

4,492,276

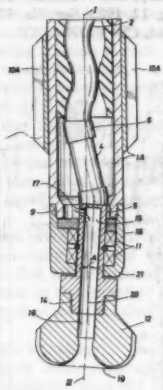
DOWN-HOLE DRILLING MOTOR AND METHOD FOR DIRECTIONAL DRILLING OF BOREHOLES

Anthony W. Kamp, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 13, 1983, Ser. No. 541,821
Claims priority, application United Kingdom, Nov. 17, 1982, 8232755
Int. Cl.³ E21B 7/04
U.S. Cl. 175—61 **8 Claims**

1. Down-hole drilling motor for directional drilling of boreholes in subsurface formations, said motor including a motor housing with a longitudinal axis, said housing being rigid throughout its length at all times, the upper end of the housing being provided with upper connector means for connecting the motor to the lower end of a drill string, a rotor mounted on a rotor shaft and being rotatable relative to the housing, flexible connector means connecting the rotor shaft to an output

shaft provided with lower threaded connector means for threaded engagement with a drill bit, and a bearing unit mounted in the lower end of said housing and having an inclined bore therethrough at all times that supports the output



shaft in an inclined position relative to the axis of the housing at all times, such that the central axis of rotation of the output shaft intersects the longitudinal axis of the housing at a point of intersection located outside the housing and below the lower end of the housing.

4,492,277

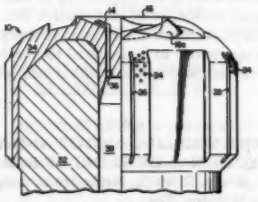
HYDRAULIC ENERGY DRILL BIT

Kenneth R. Creighton, 3238 Otterson Dr., Oklahoma City, Okla. 73112

Filed Feb. 22, 1983, Ser. No. 468,655

Int. Cl.³ E21B *10/60*

U.S. Cl. 175—329 **16 Claims**



1. A drill bit for drilling a foundation having a bit face matrix for supporting a plurality of cutters, the bit face matrix having one or more centrally-located fluid passages therein for discharging a fluid to flow over the bit face matrix, and at least one radius nozzle having the shape of an annular projection surrounding said fluid passages for restricting a surface fluid flow area between the foundation and the bit face matrix to create a high velocity radial fluid flow across the major surface area of the bit face matrix, said radius nozzle being located intermediate said fluid passages and the major surface area of said bit face matrix.

4,492,278

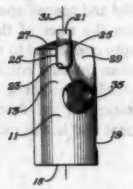
ROOF BIT

Joseph C. Leighton, Bridgeport, W. Va., assignor to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 492,908, May 9, 1983, abandoned. This application Jul. 27, 1984, Ser. No. 635,466

Int. Cl.³ E21B *10/58*

U.S. Cl. 175—410 **2 Claims**



1. A cutter bit for roof drilling, comprising:

a cylindrically shaped tubular body having a cylindrical exterior, a solid upper end and an open lower end, the solid upper end being of the same outside diameter as the lower end of the cylindrically-shaped body;

the body having an upwardly opening groove formed transversely of the upper end of the body;

a plate-like, hard carbide insert fixed within the groove and extending outwardly thereform to form a cutting edge;

the upper end of the body having multiple work surfaces including a pair of oppositely disposed, tapered heel surfaces extending downwardly and outwardly in a direction away from the longitudinal central axis of the body and a pair of oppositely disposed, tapered dust control surfaces, the dust control surfaces being disposed on an inclined angle greater than that of the heel surfaces; and

the body having a pair of openings formed beneath the groove and extending inwardly in open communication with the hollow interior of the body, the openings being formed diametrically opposite each other on an axis transverse to the longitudinal central axis of the body, and at least partly on the tapered dust control surfaces, and wherein the remaining portion of each of said openings is located on the outside diameter of said cylindrically-shaped body.

4,492,279

INFANT HEALTH MONITORING SYSTEM

Frank H. Speckhart, 534 Dellwood Dr., Knoxville, Tenn. 37919

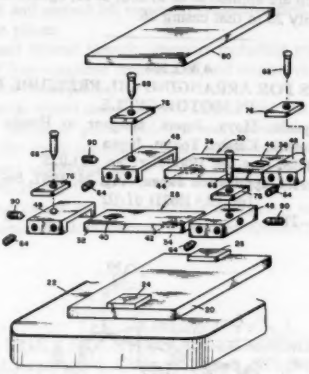
Filed Sep. 29, 1982, Ser. No. 428,389

Int. Cl.³ G01G *23/18, 3/14, 3/08*; A61B *19/00*

U.S. Cl. 177—45 **4 Claims**

1. A scale for weighing infants comprising: a base; a first pair of cantilevers mounted on the base adjacent one end of the base; a second pair of cantilevers mounted on the base adjacent the other end of the base; a first strain gauge mounted on the upper surface of one of said first pair of cantilevers; a second strain gauge mounted on the lower surface of the other of said first pair of cantilevers; a third strain gauge mounted on the lower surface of one of said second pair of cantilevers; a fourth strain gauge mounted on the upper surface of the other of said second pair of cantilevers, said first and fourth strain gauges being mounted on diagonally opposite cantilevers, and said second and third strain gauges being mounted on diagonally opposite cantilevers; said strain gauges being connected in Wheatstone bridge circuit comprising a voltage source and four nodes, one lead of each of said third and fourth strain gauges being connected to the first of said nodes, one lead of each of said first and second strain gauges being connected to the second of said nodes, the other leads of said first and fourth strain gauges being connected to the third of said nodes, the other leads of said second and third strain gauges being connected to the fourth of said nodes; means for providing a signal

corresponding to the voltage difference between said first and second nodes; and a platform supported by said cantilevers, four slideable members, one of said slideable members being adjustably mounted on each of said cantilevers, each slideable

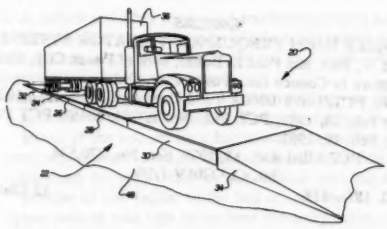


member having a support surface formed in its upper face adapted to receive a conically terminated support pin; and four support pins, each support pin being in pivotable engagement with one of said support surfaces whereby said platform is supported by said support pins.

4,492,280
WEIGHING APPARATUS INCLUDING LOAD CELLS WITH INTRINSIC SAFETY BARRIER

William C. Susor, deceased, late of Westerville, Ohio (by Rita M. Susor, executor, assignor to Masstron Scale Inc., Columbus, Ohio

Filed Feb. 28, 1983, Ser. No. 470,251
Int. Cl.³ G01G *3/14*; G01L *1/22*
U.S. Cl. 177—211 **6 Claims**



5. Weighing apparatus, comprising

more than four load cells, each having excitation input terminals and signal output terminals, all of said excitation input terminals being connected in parallel and all of said signal output terminals being connected in parallel,

voltage source means supplying an excitation voltage across output terminals thereof,

means for coupling said voltage source output terminals across said parallel-connected excitation input terminals of said load cells, said means including at least one intrinsic safety barrier, and

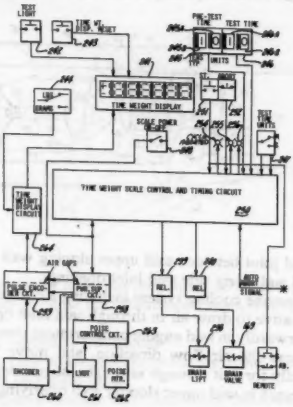
voltage measuring means coupled to said parallel connected signal output terminals,

wherein said load cells each comprises a bridge network including four strain gauge elemens, each element having a resistance greater than one thousand ohms.

4,492,281
WEIGH SCALE

Kent Van Allen, New Baltimore, and James M. Bordato, Grosse Pointe Wds., both of Mich., assignors to Scans Associates, Inc., Livonia, Mich.

Filed Mar. 1, 1982, Ser. No. 353,171
Int. Cl.³ G01G *7/00, 19/52, 3/14*
U.S. Cl. 177—213 **16 Claims**



1. In a weigh scale of the dual-beam type having large and small platform supports supporting high-flow and low-flow buckets respectively, a linear variable differential transformer to detect vertical movement of said platform supports, a ball screw with a movable poise weight operatively attached to one of said dual beams to keep said scale in balance while media is flowing into one of said buckets by movement of said poise weight, an encoder operatively attached to said ball screw to record the movement thereof, a poise motor to turn said ball screw, a pulse encoder, and a pulse encoder circuit to produce pulse train signals related to the movement of said ball screw, and a poise control circuit to accept signals from said pulse encoder circuit and said linear variable differential transformer to control the operation of said poise motor to keep said scale in balance as media enters said flow buckets, the improvement consisting of an improved poise control circuit including in combination circuitry providing low gain with high integration for use while said scale is running and, in addition, being adapted to provide a DC gain boost when said scale is being calibrated to provide for high gain and derivative action of said circuitry during calibration.

4,492,282
SIX-WHEEL ARMORED VEHICLE

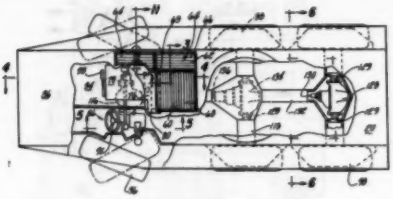
Irving Appelblatt, West Bloomfield, and Peter Krawiecki, Utica, both of Mich., assignors to Cadillac Gage Company, Warren, Mich.

Continuation of Ser. No. 182,254, Aug. 28, 1980, abandoned. This application Feb. 22, 1983, Ser. No. 468,114
Int. Cl.³ B60L *11/00*
U.S. Cl. 180—68.1 **6 Claims**

1. An armored vehicle comprising:

A. A hull having a front end, a rear end, lateral side walls, and a top wall defining an enclosed interior space including an engine compartment defined in the front end of said vehicle at one side of the hull and a driver's compartment defined in the front end of said vehicle at the other side of the hull along-side said engine compartment, said front end of said hull including an upper sloping wall blending at its upper rearward edge with the forward edge of said top wall, said engine compartment extending into said front end of said vehicle beneath said upper sloping wall;

B. Wheel means supporting said hull;
C. An engine mounted in said engine compartment and drivingly connected to said wheel means when normally propelling said vehicle for travel in a forward direction;
D. An air inlet opening in said top wall rearwardly of the blend joint between said upper sloping wall and said top wall;
E. An air exhaust opening in said top wall rearwardly of the



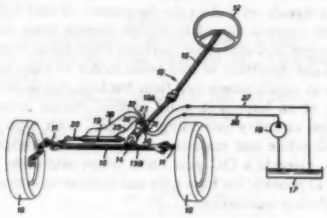
blend joint between said upper sloping wall and said top wall and along side said inlet opening;
F. An engine cooling system including air circulation means operative to draw air in through said inlet opening, move it forwardly in said engine compartment over said engine, reverse the air flow direction, and move the air rearwardly for exit through said exhaust opening; and
G. A hatch in said upper sloping wall overlying said driver's compartment.

4,492,283

POWER-ASSISTED STEERING DEVICE FOR MOTOR VEHICLES

Patrice Bertin, Paris, France, assignor to Valeo, Paris, France

Filed May 12, 1982, Ser. No. 377,394
Claims priority, application France, May 12, 1981, 81 09391
Int. Cl.³ B62D *5/08*
U.S. Cl. 180—148 **6 Claims**



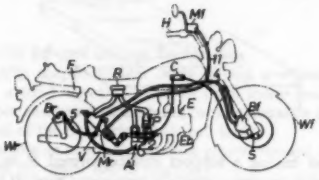
1. Power-assisted steering device for motor vehicles, comprising means, operated by the driver, for steering the vehicle **10**, acting on means for changing its direction **11**, said means **10** for steering the vehicle including a two-part rotating transmission component **13**, said two parts **13A**, **13B** possessing a limited degree of relative angular play allowing said parts **13A**, **13B** to become offset in the angular sense as a result of the action of said means **10** for steering the vehicle, and power-assistance means **17**, **18**, **19**, **21**, which, in response to such angular offset are allowed to operate on said means **11** for changing the direction of the vehicle in the same direction as that of the means **10** for steering the vehicle, said power assistance means including a source of hydraulic power, **17**, **18**, an actuator **19** acting on the means **11** for changing the direction of the vehicle, and a distributor **21** inserted between the source of hydraulic power **17**, **18** and the actuator **19** and having at least one rotor disc **23A**, **23B** rigidly fixed in rotation to one of said two parts **13A**, **13B**, said rotor disc **23A**, **23B** being provided with hydraulic passages **24A**, **24B** and being housed in a cavity **25** of a casing **26** with a small degree of axial play J between a base **27** of this cavity **25** and a closure member **28** fixed to the casing **26**, characterized in that the closure member **28** is positioned with respect to the casing by spaced lugs **51** on the closure member **28** which surround the rotor disc **23A**, or **23B** and which are applied so as to abut at **52**, against the base **27** of the cavity **25** in that casing **26**.

4,492,284

APPARATUS FOR ARRANGING OIL PRESSURE PUMP IN MOTOR-CYCLE

Tsutomu Hayashi, Hoya, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1982, Ser. No. 411,025
Claims priority, application Japan, Aug. 24, 1981, 56-132416
Int. Cl.³ B62D *61/02*
U.S. Cl. 180—219 **6 Claims**



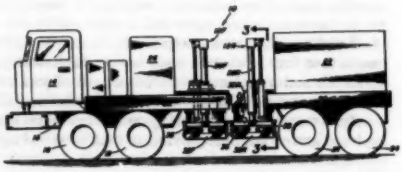
1. In an apparatus for arranging an oil pressure pump in a motor-cycle having mounted thereto an engine equipped with front and rear engine blocks projecting to the right and left from a vehicle frame and positioned so as to deviate from each other in the longitudinal direction of the vehicle frame, the improvement wherein said oil pressure pump is disposed at the rear of said front engine block which is offset, in the forward direction of the vehicle frame, said front engine block having an overhead cam shaft mounted thereon with its axis extending in the longitudinal direction of the vehicle frame, the rear end of said cam shaft being operatively connected to an operation portion of said oil pressure pump for power transmission therebetween.

4,492,285

MOBILE HIGH FREQUENCY VIBRATOR SYSTEM

Delbert W. Fair, and Paul L. Buller, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

PCT No. PCT/US79/00603, § 371 Date Apr. 13, 1981, § 102(e) Date Feb. 24, 1981, PCT Pub. No. WO81/00459, PCT Pub. Date Feb. 19, 1981
PCT Filed Aug. 13, 1979, Ser. No. 270,536
Int. Cl.³ G01V *1/09*
U.S. Cl. 181—114 **12 Claims**



10. A seismic vibrator system including a mobile carrier having motive power in combination with dual seismic vibrators, the combination comprising:
carrier means including elongated load frame steerably supported by front and rear assemblies;
first and second vibrators and lift means assemblies secured in juxtaposition at a central longitudinal position of said

load frame for ground contact between said front and rear wheel assemblies;

first and second base plates for earth engagement to couple vibratory energy;

vibration isolation means resiliently connecting each of said first and second lift means to respective first and second base plates;

first and second seismic vibrators including reaction mass and frame secured centrally of said respective of first and second base plates;

hydraulic means energizable to actuate said first and second lift means to place said first and second base plates in similar earth-coupling contact while said front and rear wheel assemblies retain traction contact with the earth surface; and

control means for synchronously energizing said first and second vibrators through a selected vibratory sequence.

4,492,286

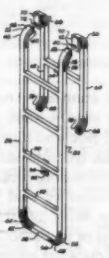
TRUCK MOUNTED LADDER ASSEMBLY

David H. Lemire, Rte. 3, Box 36, Lugoff, S.C. 29078

Filed May 17, 1982, Ser. No. 379,270

Int. Cl.³ E06C 5/00

U.S. Cl. 182—93 **3 Claims**



1. A ladder assembly for use on trucks to provide access to the interior of an open top body of said truck which includes vertically extending high side walls and end walls which are supported on a bed comprising:

a pair of laterally spaced vertically extending side rails constructed of a single length of square tubing integrally joined at the bottom by a horizontally extending rung;

vertically spaced rungs extending between said side rails;

a fastening device carried by said ladder securing a lower portion of said ladder to the bed of said truck;

upper ends of said rails being bent inwardly ninety degrees to said vertically extending portion of said rails towards the outside wall of said body so as to mount perpendicular to said outside wall of said body, said upper bent-in ends holding said side rails away from said side walls of said truck;

said rails having right angeled corners at the junction of said side rails and said bottom rung and at the junction of said side rails and said inwardly bent upper ends;

three sides of said tubing at said corners being bent inwardly by a forming die producing reinforcing sections and a fourth outer side opposite the radius of bend being smooth providing strenthened corners;

a threaded bolt receiver carried by the upper ends of said rails; and

bolts extending through said side wall of said body into said threaded bolt receivers and into the hollow of the tubing securing said ladder to said wall.

4,492,287

APPARATUS FOR UTILIZING THE IMPACT FORCE OF BODIES FALLING UNDER GRAVITY

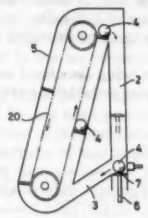
Masayu Umehara, 8, Kita 5-chome, Takayasu-cho, Yao-shi, Osaka, Japan

Filed Jul. 8, 1982, Ser. No. 396,475

Claims priority, application Japan, Aug. 6, 1981, 56-124873

Int. Cl.³ F03G 3/00

U.S. Cl. 185—33 **5 Claims**



1. An apparatus for allowing the impact force of a plurality of falling bodies to cause the rotation of a shaft, said apparatus comprising:

a main pipe vertically positioned,

an inclined pipe branched downwardly from the middle portion of said main pipe,

a communicating passage interconnecting the lower end of said inclined pipe and the upper end of said main pipe,

a plurality of steel balls having a diameter smaller than the inside diameter of said main pipe and said inclined pipe and passing through said main pipe, said inclined pipe and said communicating passage,

a conveyor accommodated in said communicating passage and adapted to carry said steel balls from the lower end of said inclined pipe to the upper end of said main pipe,

a rod with a head disposed in said main pipe coaxially therewith,

a means for biasing said rod upwardly,

a pinion meshed with a rack on the lower portion of said rod,

a shaft disposed through said pinion coaxially therewith, and

a means for transmitting the rotation of said pinion to said shaft only when said rod moves downwardly.

4,492,288

GROUP CONTROL FOR ELEVATORS CONTAINING AN APPARATUS FOR CONTROLLING THE DOWN-PEAK TRAFFIC

Joris Schröder, Lucerne, Switzerland, assignor to Inventio AG, Hergiswil, Switzerland

Filed Mar. 21, 1983, Ser. No. 476,991

Claims priority, application Switzerland, Apr. 8, 1982, 2187/82

Int. Cl.³ B66B 1/18

U.S. Cl. 187—29 R **7 Claims**

1. A group control for elevators including a number of elevator cars of an elevator group and containing an apparatus for controlling the DOWN-peak traffic by means of which a defined number of down hall calls is allocated to each elevator car in the elevator group, said group control comprising:

a hall call storage containing first storage locations;

a number of switching circuits, each switching circuit being operatively associated with a respective one of said cars;

a monitoring counter contained in each switching circuit;

said monitoring counter storing said defined number of down hall calls and limiting a number of entering stops for the relevant car associated with said switching circuit to said stored defined number;

waiting list means provided for each of said switching circuits and containing second storage locations;

said down hall calls being stored in said second storage

locations of said waiting list means in their chronological input sequence;

a number of allocating storages to each of which a respective one of said switching circuits is connected and each of which allocating storages contains third storage locations operatively associated with said first storage locations;

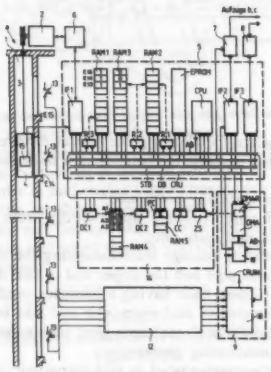
said third storage locations of said allocating storages storing allocation instructions limited to a control counter state of its related monitoring counter, said allocation instructions being associated with the chronologically consecutive down hall calls stored in said waiting list means, to thereby form groups of hall calls;

a respective priority counter provided for each switching circuit;

each priority counter being associated with a respective one of said cars and being settable to a priority number corresponding to the chronological age of a hall call such that upon storing a respective latest call in said waiting list means the respective earliest hall call is allocated by storing a respective allocation instruction to that one of said cars which will most rapidly service said respective earliest hall call;

said groups of hall calls, upon arrival of a further hall call, being sequentially increased in their order of priority such that the respective earliest hall call in one of said groups is transferred to another one of said groups associated with one of said cars having the next-higher priority and the respective latest hall call is allocated to the car having the lowest priority; and

said groups of hall calls being generated in the same size with respect to one another until said number of down hall calls stored in said monitoring counter is reached.



4,492,289

INTERNAL SHOE DRUM BRAKE

Robert J. Warnock, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

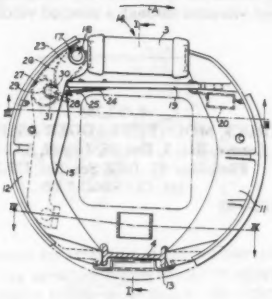
Filed Nov. 9, 1981, Ser. No. 319,713

Claims priority, application United Kingdom, Dec. 30, 1980, 8041500

Int. Cl.³ F16D 65/58

U.S. Cl. 188—79.5 GE **3 Claims**

1. A self-adjusting shoe drum brake comprising an actuator operably connected to the shoes to move them apart into braking engagement with the drum; shoe return spring means operably connected to said shoes to retract said shoes out of engagement with the drum when said actuator is deactivated; an automatic adjuster element movably mounted on one of the shoes; a strut extending between the shoes and engaging said one shoe via said adjuster element so that the spacing between the shoes in the retracted position is dependent upon the position of said adjuster element with respect to said one shoe; a spring connected at one end to said strut and at the other end to said adjuster element to resiliently urge said adjuster element and said strut into engagement with each other; a helical spring connected at one end to said strut and at the other end to said other shoe to urge said strut and other shoe toward each other to constrain said strut to follow outward movement of the other shoe; a rotatable adjuster cam mounted on said one shoe; means to resiliently urge said cam to rotate; an additional helical spring connected at one end to said strut and at the other end to said one shoe to resiliently urge said cam into engagement with said adjuster element; cooperating means on said cam and adjuster element to prevent rotation of said cam when in engagement with said adjuster element; and means to provide limited free play of said strut upon separation of said shoes by said actuator for controlling the desired clearance between said shoes and drum in the retracted position comprising a slot in said other shoe, a hook shaped extension on said strut interfitting in said slot, and a gap between said extension and one side of said slot when in said retracted position, said extension and said slot extending substantially perpendicular to the direction of movement of said strut when the brake is actuated, and said gap being on the side of said extension opposite to the direction of movement of said other shoe when actuated; so that, when outward movement of the shoes by said actuator exceeds a predetermined value, the strut and adjuster element are displaced by said other shoe to disengage the adjuster element from the cam and the cam is rotated in a direction to re-engage said adjuster element and thereby set a new retracted position of the shoes when the actuator is deactivated.



4,492,290

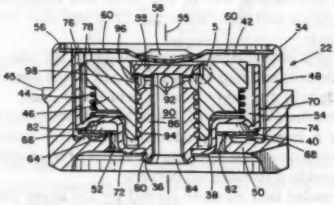
ACCELERATION SENSITIVE COMPRESSION HEAD

Eugene N. Zavodny, Bloomingdale, Ill., assignor to Maremont Corporation, Carol Stream, Ill.

Filed Jan. 12, 1983, Ser. No. 457,437

Int. Cl.³ F16F 9/34

U.S. Cl. 188—322.14 **9 Claims**



1. An improved compression head assembly for an automo-

tive shock absorber, providing (a) regulated flow from a compression chamber to a reservoir during shock absorber compression, (b) relatively unrestricted flow from the reservoir to the compression chamber during shock absorber recoil, and (c) a uniquely decreased resistance to flow from the compression chamber to the reservoir during relatively highly accelerated shock absorber compression; the compression head assembly comprising:

a compression head with a wall portion and a ledge portion, the head defining a space within the wall portion and an opening through the ledge portion;

a valve disk loosely mounted in the space adjacent the orifice;

a cup slidably mounted in the space adjacent the disk and defining a chamber, the cup and compression head ledge portion cooperatively defining thereon orifice and restriction valve seats with orifice and restriction valve openings among the orifice and restriction valve seats;

a pin mounted to the cup in the chamber, the pin defining a passage therethrough;

a mass slidably mounted to the pin in the chamber for movement to and from a position closing the passage;

means in the chamber for biasing the mass to the position closing the passage;

and means for retaining the disk, cup, pin, mass and biasing means in the space defined by the head;

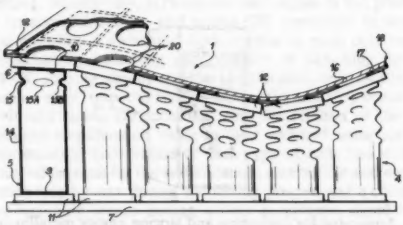
whereby the regulated flow and the relatively unrestricted flow occur through the orifice and restriction slots as permitted by the valve disk, and the flow during the uniquely decreased resistance to flow occurs through the passage when shock absorber acceleration moves the mass relative to the pin to open the passage.

4,492,291

DEVICE FOR DAMPING SHOCKS CAUSED BY MOVING HEAVY OBJECTS

Pierre Chometon, Saint Germain en Laye, and Jacques Dollfus, Les Essarts-le-Roi, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 10, 1982, Ser. No. 347,378
Claims priority, application France, Feb. 13, 1981, 81 02882
Int. Cl.³ F16F 7/12; G21C 19/06
U.S. Cl. 188—377 **4 Claims**



1. A device for damping shocks due to impacts by heavy moving objects, comprising:

(A) a plurality of substantially identical tubular members, each of which has

(1) an axis,

(2) a pair of axially opposite ends, and

(3) a radially deformed portion intermediate its ends that allows the member to be endwise crushed by a substantially axial compressive impact;

(B) a supporting plate to which each of said members is secured at one of its ends and from which said members all project in one direction, in radially spaced relation to one another;

(C) a plurality of substantially thick supplementary plates, one for each of said members, each

(1) rigidly secured to the other end of its member, normal to the axis thereof, and

(2) having edge portions spaced radially outwardly from its member that oppose edge portions of supplementary plates on adjacent members to maintain the members radially spaced from one another notwithstanding axial crushing deformation of them;

(D) a bendingly deformable perforated sheet overlying said supplementary plates and having a plurality of apertures, one for each said member, each aperture being substantially coaxial with its member;

(E) means at the edge of each said aperture bonding the perforated sheet to the supplementary plate beneath the aperture; and

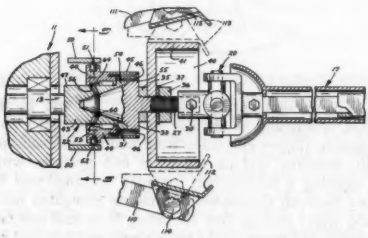
(F) a substantially imperforate sheet overlying said perforated sheet and having edge portions substantially coterminuous with those of the perforated sheet and bonded to them, so that portions of said imperforate sheet and said perforated sheet that are inward of their said edge portions are flatwise slidable relative to one another.

4,492,292

COUPLING SYSTEM FOR POWER TAKE-OFF SHAFTS

Charles C. Thor, Box 654, Hutchinson, Minn. 55350

Filed Aug. 6, 1982, Ser. No. 405,908
Int. Cl.³ F16D 11/00, 25/08
U.S. Cl. 192—67 R **4 Claims**



1. A coupling mechanism comprising, in combination:

(a) a first coupling member having a convex conical surface tapering along an axis from a smaller first end to a larger second end, said surface including a peripheral groove spaced from said ends and having the cross-section of a portion of a circle, said first coupling member further including a first external gear peripheral to said second end thereof;

(b) a second coupling member having a concave conical surface congruent with said convex surface and tapering from a small end to a large end, said second member including a second external gear peripheral to said large end thereof, said second coupling member including latching means operable to cooperate with said peripheral groove in said first member to retain said first and second coupling members in axial relation when said first member is received in said second member with said external gears disposed in axially adjacent and coaxial relationship, one with the other;

(c) a driving member comprising an internal gear sized to simultaneously mesh coaxially with the external gears of said first and second coupling members and thereby transmit power from said second coupling member to said first coupling member, the width of said internal gear face being substantially the same as the sum of the widths of the gear faces of the external gears of said first and second coupling members;

(d) means actuable to move said first coupling member axially into a position in which the concave and convex surfaces of said first and second coupling members are in engagement;

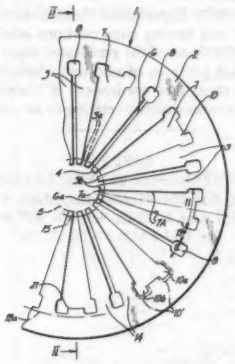
(e) and means actuable to move said driving member axially so as to selectively engage either one or both of said external gears.

4,492,293

DIAPHRAGM SPRING FOR USE IN FRICTION CLUTCHES OR THE LIKE

Paul Maucher, Sasbach, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Jan. 6, 1982, Ser. No. 337,516
Int. Cl.³ F16D *13/44*
U.S. Cl. 192—89 B **12 Claims**



1. A diaphragm spring, particularly for use in friction clutches, comprising an annular main section; and a plurality of elongated fingers extending from said section substantially radially inwardly and having inner end portions with end faces defining a substantially circular opening, said fingers defining between themselves alternating elongated narrower first and wider second slots extending from said end faces to said section and respectively having enlarged first and second outermost portions of lesser and greater width, as considered in the circumferential direction of said section, the width of said first slots being at least substantially identical with the width of said second slots in the region of the inner end portions of said fingers, said fingers having outer end portions in the region of said section and the width of each second outermost portion at least approximating $2m+n$ wherein m is the width of a first outermost portion and n is the width of the outer end portion of a finger, as considered in the circumferential direction of said section.

4,492,294

BULK CONVEYOR APPARATUS

David C. Ball, LaPuente, Calif., assignor to The W. W. Sly Manufacturing Co., Strongsville, Ohio

Filed Mar. 3, 1980, Ser. No. 126,531
Int. Cl.³ B65G *11/00*
U.S. Cl. 193—25 C **5 Claims**

1. A bulk material conveyor which comprises:

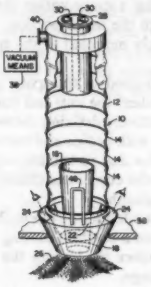
means for conveying which comprises an elongated flexible duct for conveying an associated bulk material in a first direction;

means for viewing the materials being transferred within said means for conveying; and

means for maintaining a fluid stream proximate to said means for viewing, said fluid stream moving in a second direction which is substantially opposite to said first direction, said maintaining means including:

(a) a first truncated conical member having an outside diameter which varies from a first outside diameter to a second outside diameter which is greater than said first outside diameter;

(b) a second truncated conical member having an inside diameter at least at one axial cross-section which is greater than said first outside diameter of said first truncated conical member, said second truncated conical member being disposed in substantially coaxial relationship to said first truncated conical member with at least an axial portion thereof overlapping a portion of said first truncated conical member; and,



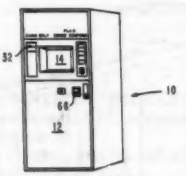
(c) a third truncated conical member having an inside diameter at least at one axial cross-section which is greater than said first outside diameter, said third truncated conical member being disposed at least partly in axially overlapping relationship with said second truncated conical member.

4,492,295

AUTOMATED REDEMPTION CENTER FOR METAL CONTAINERS

Bruce H. DeWoolfson, Arlington, Va., assignor to Environmental Products Corporation, McLean, Va.

Continuation-in-part of Ser. No. 355,206, Mar. 5, 1982, Pat. No. 4,440,284, which is a continuation-in-part of Ser. No. 148,371, May 9, 1980, Pat. No. 4,345,679. This application May 13, 1982, Ser. No. 377,918
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.
Int. Cl.³ G07F *7/06*
U.S. Cl. 194—4 C **13 Claims**



1. Apparatus for collecting and storing empty metallic containers having a distinguishing indicia thereon and for issuing predetermined return deposits for collected containers comprising:

preselection means for exposing a crushed or non-crushed container offered by a customer to an electromagnetic field for identifying whether said container is substantially either aluminum or steel without establishing direct electrical contact with said container, and for detecting the presence of said distinguishing indicia on said crushed or non-crushed container;

said preselection means including a container access area configured to accommodate both crushed or non-crushed containers for exposure to said field;

means for accepting only a container identified by said preselection means as being substantially aluminum or steel

and as having said distinguishing indicia thereon, independent of the configuration of said container;

dispensing means responsive to said preselection means for dispensing a predetermined payment in return for containers having a substantially aluminum or steel composition and carrying said distinguishing indicia;

means cooperating with said accepting means for crushing said containers; and

means for storing crushed containers received from said crushing means.

4,492,296

CIRCUIT ARRANGEMENT IN A COIN ACCEPTOR UNIT

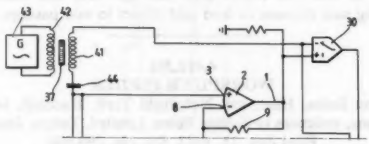
Pierre Dubey, Le Pontet, Switzerland, assignor to Autelca AG, Gumligen, Switzerland

Filed Dec. 2, 1981, Ser. No. 326,920

Claims priority, application Switzerland, Dec. 5, 1980, 8979/80

Int. Cl.³ G07D *5/08*

U.S. Cl. 194—100 A **9 Claims**



1. A circuit for a coin acceptor unit in which the coin (37) to be tested comes into the coil field of an oscillator (2,6,7), a coin acceptance signal being created dependent upon the condition whether the coin (37) will stop or start the oscillations, respectively, comprising an oscillator amplifier (2,6,7), a plurality of switching devices (21–28) connected with said oscillator amplifier, means (29) connected to control said plurality of switching devices (21–28), the amplification of the oscillator amplifier (2,6,7) being controllable step-by-step by means of said means (29) connected to control said plurality of switching devices, said means (29) connected to control said plurality of switching devices having a memory (39) in which a standard value of amplification is stored, with which the oscillations stop or start, respectively, whenever the coil field (6) is free, and two pre-determined standard limit valves of amplification being stored for each type of coin, the oscillations stopping or starting, respectively, between the said values in the presence of an acceptable coin; said means (29) connected to control said plurality of switching devices prior to each coin testing procedure by switching said plurality of switching devices (21–28) altering step-by-step the amplification until oscillations stop or start, respectively, an arithmetic unit (69) connected with said means (29) creating from the relation of the thus obtained amplification value to their standard value and the two standard limit values of each type of coin two nominal limit values each for the amplification, altering the said amplification step-by-step during the testing process and a comparator including means issuing a coin acceptance signal if the oscillations stop or start, respectively, between the two nominal limit values of a type of coin.

4,492,297

ASSEMBLY LINE ARRANGEMENT

Walter Sticht, Wankhamerstrasse 8, A-4800 Attnang-Puchheim, Austria

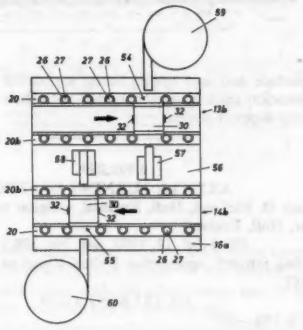
Continuation of Ser. No. 891,294, Mar. 29, 1978, abandoned. This application Apr. 23, 1980, Ser. No. 143,049

Claims priority, application Austria, Dec. 15, 1977, 8956/77

Int. Cl.³ B65G *21/20*

U.S. Cl. 198—345 **13 Claims**

1. An assembly line arrangement defining a linear conveying path for successive workpieces or workpiece carriers, which comprises a succession of replaceable in-line working stations, each working station having a conveyor section extending substantially from one end to the other end of the working station, and the conveyor sections of successive ones of the in-line working stations being arranged end-to-end in series to constitute the conveying path, the conveyor section of each working station having a succession of areas each of which accommodates a respective one of the workpieces or workpiece carriers and at least one of the successive areas being a waiting area and at least one other one of the areas being a processing area for working on the respective workpiece, and each conveyor section including guide means for vertically and laterally guiding the successive workpieces or workpiece carriers along the conveying path, the guide means being



arranged to provide access to the workpieces or workpiece carriers in the processing area from below, and discrete friction drive rollers spaced along, and separate from the guide means, the drive rollers being dimensioned and operable for individually driving each workpiece or workpiece carrier independently through the conveyor section and being so spaced along the guide means that the processing area is free of drive rollers, the guide means of each conveyor section of a respective one of the in-line working stations extending substantially to the functional ends of the working stations and being arranged to provide a continuous planar conveying path between the working stations and along the entire assembly line arrangement for securely holding the successive workpieces or workpiece carriers.

4,492,298

COIL SPRING ASSEMBLY MACHINE

Henry Zapletal, Carthage, Mo.; Horst F. Wentzek, and George M. Chembakaffery, both of Kenosha, Wis., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Sep. 10, 1981, Ser. No. 300,995

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—409 **12 Claims**

1. A coil spring assembly machine for connecting together successive groups of coil springs into an assembled matrix of coil springs, each of said coil springs having a central axis and parallel top and bottom loops extending generally perpendicular to said axis, said top and bottom loops being interconnected by at least one intermediate loop, which machine comprises,

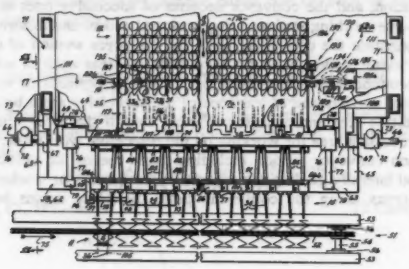
transfer means for transferring a group of coil springs from a first location to a second location, said transfer means comprising,

a group of fingers, each finger being sized to be received within a barrel of one coil spring,

means for inserting each finger in an axial direction into, and for retracting each finger axially from, one of said top and bottom loops and said barrel of said one coil spring,

means for moving said fingers, and therefore said springs, from said first location to said second location after said fingers have been inserted into said barrels of said springs,

said springs being supported in said first location upon a support surface with their axes parallel to said support



surface and said spring being supported at said second location upon a support platen with their axes normal to said support platen.

4,492,299

ARTICLE TURNING DEVICE

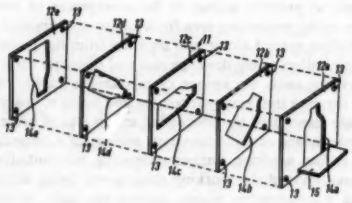
Alasdair D. McLeod, Hull, England, assignor to B.M.H. Feedgear, Hull, England

Filed Jul. 14, 1982, Ser. No. 398,135

Claims priority, application United Kingdom, Jul. 14, 1981, 8121651

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—417 **12 Claims**



1. A static article turning device comprising:

(A) a succession of plates each bearing an aperture generally of the outline shape of the article to be turned; the apertures collectively defining a path of traverse of the article through the device; and

(B) obstructions, formed in each plate subsequent to the first one along said path of traverse, by parts thereof delineating the aperture and angularly displaced in relation to the like parts of the last preceding plate, so that, as the article passes along the path of traverse the obstructions incrementally deflect the article about an axis passing therethrough and parallel with the path of traverse, thereby to change the orientation of the article; said plates being spaced so as to prevent movement of the article following any incremental deflection thereof.

4,492,300

RESILIENT-FEED BALL INJECTOR FOR MICROBALLISTIC PRINTER

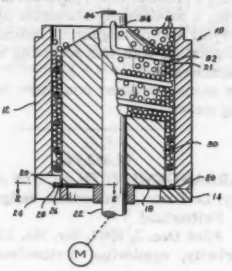
Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Stamford, Conn.

Filed May 27, 1981, Ser. No. 267,468

Int. Cl.³ B65G *47/12*

U.S. Cl. 198—443 **7 Claims**

1. Apparatus for feeding objects including in combination means forming a passage for receiving said objects, an element formed with an aperture for receiving one of said objects, said element being mounted for movement of said aperture toward said passage, a helical spring having an end disposed adjacent said element, means for driving said spring in such a direction



as to move an object supplied to said spring toward said element to bias said object into said aperture, and means for driving said element to feed said object to said passage.

4,492,301

WORKPIECE FEEDER

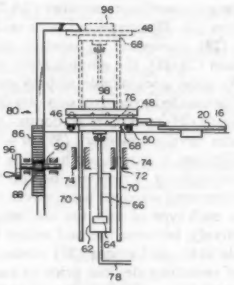
Hajimu Inaba, Hino, and Nobutoshi Torii, Hachioji, both of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Jun. 21, 1982, Ser. No. 390,560

Claims priority, application Japan, Jun. 30, 1981, 56-100501

Int. Cl.³ B65G *37/00*

U.S. Cl. 198—472 **3 Claims**



1. A workpiece feeder for successively feeding workpieces to a predetermined area, typically a workpiece gripping position of a hand of an industrial robot, said workpiece feeder including a frame, a table mounted on said frame, and an endless conveyor mounted on said table and having plurality of movable pallets interspaced from each other at equal distances, said conveyor having at least one belt run portion extending over said table and adapted to move said pallets intermittently one by one under said predetermined area; characterized in that said table has a window aligned with said predetermined area, that each of said pallets comprises a lower plate having a central opening and an upper plate which is detachably mounted on said lower plate, that there is provided a lifting means having a platform movable vertically through said window in the table and said central opening in the lower plate to engage said upper plate from below, causing said upper plate to move and lift a workpiece placed on said upper plate up to said workpiece gripping position of the robot, and that there is provided a stop mechanism engageable with said platform for limiting the upward movement thereof so that when said platform is lifted together with a workpiece placed thereon, said platform abuts against said stop mechanism thereby holding

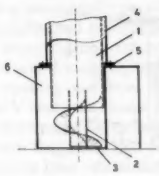
the workpiece at said predetermined area, said stop mechanism including a vertically extending pillar mounted to the frame, a stop member connected to the top of the pillar and extending horizontally toward the workpiece gripping position, and means for adjusting the vertical position of said stop member, said adjusting means including a rack mounted lengthwise of the pillar and an associated pinion which is rotatably mounted on the machine frame and is in mesh with said rack.

4,492,302

FEEDING DEVICE FOR A VERTICAL TUBE CONVEYOR

Runar Svens, Enköping, Sweden, assignor to AB Nordströms Linbanor, Enköping, Sweden

Filed Jan. 21, 1982, Ser. No. 341,210
Claims priority, application Sweden, Jan. 26, 1981, 8100455
Int. Cl.³ B65G 33/00
U.S. Cl. 198—671 **1 Claim**



1. Screw conveyor for raising powder or particulate material, comprising a cylindrical casing with a lower inlet end, a conveyor screw rotatably mounted in said casing and a feeder device for moving material toward the inlet end of said casing, said feeder device being rotatable relative to said screw and comprising at least one feeder shovel disposed about the inlet end of said casing and extending in its entirety parallel to said casing from a plane above the lower end of said casing at least down to the lowest point of said conveyor, characterized in that said shovel forms a spiral drum which surrounds the inlet end of said casing, that said shovel has a top portion and a bottom portion, each of which defines a plane which is perpendicular to the axis of rotation of said conveyor screw, that said shovel describes, in a plane perpendicular to the longitudinal axis of said casing, a spiral curve which has a starting edge and a trailing edge and which starts from a point a short distance from said casing, the angle formed between the tangent to said spiral curve and the rotational, directional component being constant at every point along said spiral curve, that said angle is so small that said shovel moves the material inward with a force which is greater than the outwardly-directed force on the material exerted by said screw, and that said starting edge and said trailing edge of said spiral curve of said shovel extending between and being perpendicular to said planes formed by said top portion and said bottom portion of said shovel.

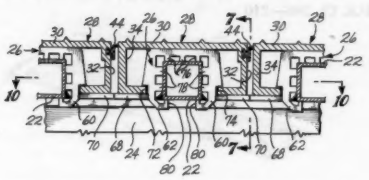
4,492,303

DRIVE/GUIDE SYSTEM FOR A RECIPROCATING FLOOR CONVEYOR

Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Filed Feb. 8, 1982, Ser. No. 346,865
Int. Cl.³ B65G 25/04
U.S. Cl. 198—750 **12 Claims**

1. A reciprocating floor conveyor, comprising:
a plurality of elongated floor members, each of which is of channel form comprising a top panel, a pair of opposite side panels projecting downwardly from the top panel, and a pair of bottom flanges projecting inwardly from the side panels;
an elongated metal guide beam for each floor member;
a plurality of transverse metal support beams;
said guide beams resting on said metal support beams;
a plurality of plastic slide bearings on the guide beams at locations where the guide beams rest on the support beams;
drive means for moving the floor members in one direction along the guide beams and bearings, for advancing a load, and for retracting them in the opposite direction; and
the improvement comprising:
each said plastic slide bearing having a top which extends the full length of the bearing above the guide beam on which the bearing is mounted, sidewall portions on each side of the bearing, extending downwardly from the top of the bearing, outwardly adjacent the sides of the guide beam, and bottom lock flanges projecting inwardly from said sidewall portions, below the guide beam;



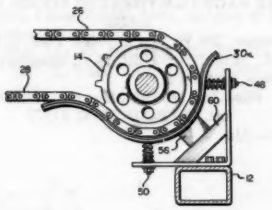
a wing on each side of the bearing, each wing extending laterally outwardly from its side of the bearing, in coplanar parallelism with the other wing, and in spaced parallelism with the top of the bearing;
said wings having lower surfaces resting on upper surface portions of the support beams, between the guide beams, and upper surfaces situated below the bottom flanges of the floor members;
each said wing having an outer edge which makes mutually bracing contact with the outer edge of an adjacent wing on a laterally adjacent plastic slide bearing, for an adjoining floor member.

4,492,304

CONVEYOR CHAIN RETAINER SHOE

Robert J. Geis, Yardley, Pa., assignor to FMC Corporation, Chicago, Ill.

Filed Dec. 14, 1981, Ser. No. 330,649
Int. Cl.³ B65G 21/20
U.S. Cl. 198—837 **2 Claims**



1. A guide shoe for retaining a conveyor chain in engagement with and trained around an arc of a sprocket, comprising
a shoe having an arcuate portion with a concave cylindrical surface complementary to a portion of the arc of a said sprocket,
a lining of anti-friction material on said arcuate portion and presenting a like concave cylindrical anti-friction surface for disposition along a length of the chain that is trained over a drive sprocket and through said arc,
a bracket for supporting said shoe and positioned such that the shoe is between the lining and the bracket,
means carried by said bracket for biasing said shoe for move-

ment toward the sprocket to maintain said concave surface of said lining in contact with said length of chain as it passes through said arc, and, a separate guide means carried by said bracket for engaging and guiding said shoe to compel its movement in a direction radially of said sprocket, thereby to maintain concentricity of said shoe with said sprocket.

4,492,305

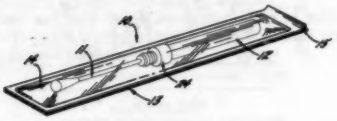
PACKAGE FOR COLLECTING CULTURES

Carl F. Avery, Overland Park, Kans., assignor to Marion Laboratories, Inc., Kansas City, Mo.

Filed Jul. 8, 1983, Ser. No. 511,851

Int. Cl.³ B65D *81/22, 85/50*; C12B *1/00*; C12K *1/10*

U.S. Cl. 206—210 **3 Claims**



1. A culture collecting package having, in combination, a sealed one-piece ampoule made of glass, said ampoule having an elongated tubular body of circular cross section and having first and second closed ends, a culture-sustaining media contained within said ampoule, a circumferentially extending score line formed in said body a preselected distance from said first end whereby the end portion of the ampoule at said first end may be broken away from the body along the score line to permit access to said media, a swab comprising an elongated stem and a swabbing tip on one end of said stem, and a unitary closure member made of a resiliently yieldable material and mounted on the other end of said stem, said member including a cup portion opening longitudinally away from said stem and sized to snugly receive the outside of said end portion and to extend beyond said score line whereby said end portion may be broken away from said body while inside the cup portion and thereafter is retained in the cup portion, said member also including a plug portion extending along said stem toward said tip and sized to fit snugly into and close the open end of said body after a culture has been collected on said tip and the latter has been inserted in the ampoule and placed in contact with said media.

4,492,306

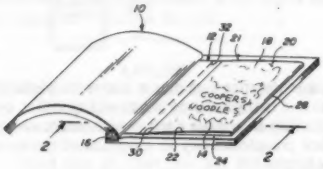
MAGAZINE PAGE DEHYDRATED FOODS IN PLASTIC BAGS

Penny S. Cooper, 336 W. 71st St., New York, N.Y. 10023, and Richard L. Miller, Dix Hills, N.Y., assignors to Penny S. Cooper, New York, N.Y.

Filed Jan. 16, 1984, Ser. No. 571,334

Int. Cl.³ B65D *27/00, 85/72*

U.S. Cl. 206—216 **5 Claims**



1. A magazine advertising device, comprising:

a sheet of material bound into a magazine as a page thereof, said sheet being folded onto itself about a fold line thereby defining a base layer and a cover layer, the fold line therebetween defining the outer edge of the page, advertising means formed onto the outer face of said cover layer, fastening means for securing the inner edge of the cover layer onto the base layer to define a pouch therebetween for receiving samples of the goods advertised on the cover layer, securing means for binding the inner edge of the base layer into the magazine, and detaching means for separating the portion of the body layer containing said pouch from the portion of the body layer bound in the magazine.

4,492,307

LEAFLET DISPENSER

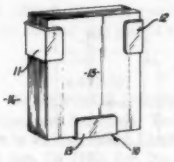
Malcolm Hargrave, 67 Garden Village, Darwen, Lancashire, England BB3 2HS

Filed Mar. 19, 1984, Ser. No. 590,218

Claims priority, application United Kingdom, Mar. 25, 1983, 8308350

Int. Cl.³ B65D *85/62*; H47B *81/00*

U.S. Cl. 206—449 **9 Claims**



1. A dispenser for leaflets or the like comprising at least three channel-section members of like configuration, each having a base wall and two opposed side walls and having on said base wall at least one protrusion extending within said channel thereby defining at least two sub-channels.

4,492,308

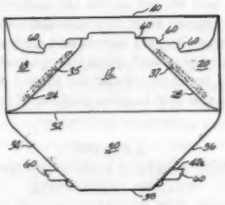
QUICK OPENING ENVELOPE

David M. Meeker, Saratoga, and Harold R. Lillibridge, Burlingame, both of Calif., assignors to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 448,794, Dec. 10, 1982, abandoned, which is a continuation-in-part of Ser. No. 353,176, Jul. 1, 1982, abandoned. This application Jan. 17, 1984, Ser. No. 571,642

Int. Cl.³ B65D *27/34*

U.S. Cl. 206—610 **4 Claims**



1. A quick opening reclosable envelope constructed from a single sheet of flexible sheet material, said envelope comprising:

a substantially rectangular front panel having opposed inner and outer surfaces and a top edge, a bottom edge, and first and second opposed side edges;

first and second side flaps having opposed inner and outer surfaces and being hingedly connected respectively to said first and second opposed side edges of said front panel, the inner surfaces of said first and second side flaps being in abutting relationship with said inner surface of said front panel;

a planar back panel having opposed inner and outer surfaces, and a top edge, a bottom edge, and two opposed side edges, the bottom edge of said back panel being hingedly connected to the bottom edge of said front panel; and the inner surface of said back panel being attached with releaseable adhesive material to the outer marginal surfaces of said first and second side flaps;

a closure flap having opposed inner and outer surfaces, and a top edge hingedly connected to the top edge of said front panel, an adhesive portion being centrally disposed on said inner surface of said closure flap adjacent the free edge thereof opposite said top edge thereof, the distance from said top edge of said closure flap to said adhesive portion thereof being such that said closure flap may be adhesively secured to the outer surface of said back panel thereby securely closing said envelope;

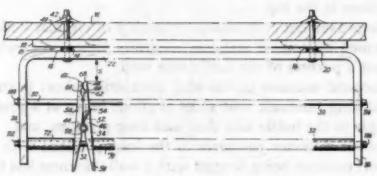
a V-shaped formation of elongated perforations in said closure flap each perforation of which includes a curved portion and a straight portion, each of said straight portions extending substantially parallel to said bottom edge of said back panel, said straight portions of each of said perforations accomodating the bending and twisting of the portion of said closure flap lifted which occurs during an envelope opening operation;

the apex of said V being the closest part of said V to the top edge of said front panel and defining a pull tab for separating said closure flap along said perforations and along a pair of severance lines substantially perpendicular to the top edge downwardly to the free edge for separating said back panel from the outer marginal surfaces of said first and second side flaps for opening said envelope.

4,492,309

MULTIPLE-OBJECTS SUPPORT RACK

Nicholas R. Fedoryshyn, 14 Evelyn La., Syosset, N.Y. 11791

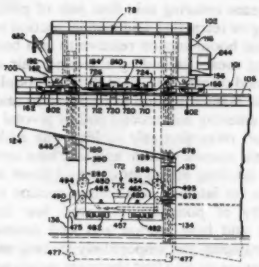
Filed Jun. 10, 1982, Ser. No. 386,925
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—65 **8 Claims**

1. Apparatus for the support of a plurality of objects on a supporting structure, said apparatus comprising a support means and a plurality of clamps on said support means for the respective engagement of said objects, said clamps each including clamping members and spring means operatively associated with said members for resiliently urging one of the members towards the other of said members, said clamps being arranged in spaced rectilinear alignment and being clothespin-like structures, said support means including an anchor means for being connected to said supporting structure and detachable means detachably coupled with said anchor means to support said clamps thereon, said support means comprising a bracket including spaced arms and two spaced rods extending in parallel between and supported by said arms, said rods extending through and supporting said clamps; and spacers on said rods between said clamps to space the latter, said clamps being provided with elongated openings through which said rods pass.

4,492,310

APPARATUS AND METHOD FOR LOADING AND UNLOADING CARGO LIGHTERS ON OR FROM SHIPS

Brooks E. Weingart, Alliance, Ohio, assignor to AMCA International Corporation, Hanover, N.H.

Filed Apr. 6, 1982, Ser. No. 365,916
Int. Cl.³ B63B *35/40*
U.S. Cl. 212—191 **35 Claims**



1. A crane for transporting a lighter from a floating position adjacent the stern of a ship to a storage location aboard said ship or for transporting said lighter from said storage location to said floating position comprising:

a hoist support structure of sufficient transverse dimension to span the width of the cargo hold of said ship;

means including wheel means for moving said hoist support structure fore and aft along spaced rails extending longitudinally along opposite sides of said ship;

hoisting means mounted on said hoist support structure;

a load frame suspended by said hoisting means, said load frame including roller guide means, said load frame being adapted for attachment to said lighter; and

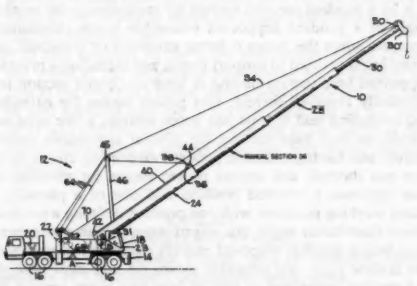
vertically extendable and retractable load frame guide means depending from said hoist support structure, said extendable and retractable guide means including vertically elongated channel means for engaging said roller guide means, said extendable and retractable guide means being adapted for restraining the swinging movement of said lighter when said lighter is hoisted.

4,492,311

COUPLING AND LATCHING MECHANISM FOR EXTENSIBLE BOOM

Robert A. Rathe, Cedar Rapids, Iowa, assignor to FMC Corporation, Chicago, Ill.

Filed Aug. 17, 1981, Ser. No. 293,729
Int. Cl.³ B66C *7/00, 23/56, 23/04*
U.S. Cl. 212—264 **4 Claims**



1. An extensible telescopic boom for a crane or the like having a cab comprising means defining a tubular base section;

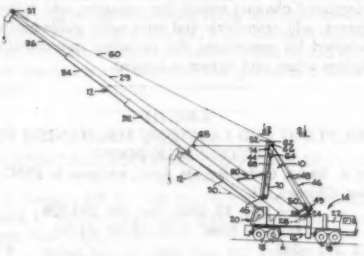
means supporting said base section for pivotal movement about a horizontal axis; means defining a manual section telescopically received in said base section; means defining at least one additional boom section telescopically received in said manual section; power means including a single cylinder connected to said additional section and a reciprocable piston rod extending therefrom; first and second abutment means rigidly secured to said piston rod; first coupling means including a first a pair of pivotal jaw means mounted on said base section for coupling said power means to said base section in response to said first abutment means entering said first pair of pivotal jaw means for extending or retracting said manual section and said at least one additional boom section relative to said base section; section coupling means including a second pair of pivotal jaw means mounted on said manual section for coupling said power means to said manual section in response to said second abutment means entering said second pair of pivotal jaw means for extending and retracting said at least one additional section relative to said manual section and said base section; powered base-manual latching means mounted adjacent one end of said boom section for latching said manual section in selected one of a plurality of positions; powered jaw latching means mounted on said base section and said manual section for selectively engaging and respectively locking said first pair of pivotal jaw means on said first abutment means and said second pair of pivotal jaw means on said second abutment means in coupling position in response to the associated pair of pivotal jaw means being in coupling position; first operator controlled means in said cab for selectively controlling said base-manual latching means and said jaw latching means; and second operator controlled means for extending and retracting the piston rod.

4,492,312

EXTERNAL PENDANT PAY-OUT SYSTEM WITH ANTI-DROOP CONTROL

Darwin N. Poock, Cedar Rapids, Iowa, assignor to FMC Corporation, Chicago, Ill.

Filed Jun. 30, 1982, Ser. No. 393,985
Int. Cl.³ B66C *23/04, 23/56, 7/00*
U.S. Cl. 212—264 **3 Claims**



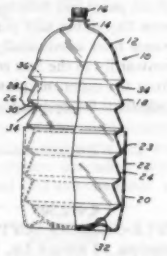
1. In a pendant pay-out system for maintaining the working angle of a pendant supported extensible boom substantially constant when the boom is being extended or retracted, said boom being pivoted to support means and including a pivotally supported base section having at least one boom section telescopically received therein, first power means for extending and retracting said at least one boom section, a live mast supported on said base section for pivotal movement relative thereto and having rotatable pendant supporting means on the free end thereof, and second power means for pivoting the mast between a lowered position and one of a plurality of raised working positions with one position defining a predetermined mast-boom angle, the improvement whih comprises: a fixed length pendant disposed entirely externally of said boom and trained over said rotatable means on said mast with one end portion connected to said at least one boom section and another end portion supportively connected to said base section, reversible power operated pendant haul in or pay out means operatively connected to said pendant for hauling in or paying out pendant, and control means mounted between said mast and base section being responsive to detecting slight angular deviations of said boom from said predetermined angle due to extension of the boom or retraction of the boom for actuating said reversible power operated means to respectively pay out or haul in sufficient pendant to maintain the boom at a predetermined angle and said mast-boom angle substantially constant during extension and retraction of the boom, said rotatable pendant supporting means including a first set of sheaves journaled on said mast, said reversible power means including a hydraulic ram having a movable portion and a stationary portion, means connecting said stationary portion to said mast, a second set of sheaves mounted for rotation on the movable portion of said ram, said pendant having multiple parts of pendant trained over said sets of sheaves.

4,492,313

COLLAPSIBLE BOTTLE

William Touzani, 318 Capitol St., Vallejo, Calif. 94590

Filed May 29, 1984, Ser. No. 614,860
Int. Cl.³ B65D *1/40*
U.S. Cl. 215—1 C **18 Claims**



1. A collapsible plastic bottle having a top and a base joined by a substantially cylindrical side wall integral therewith and an aperture in the top,

the improvement comprising a plurality of circular bellows formed by conical sections integrally joined to create at least a portion of the bottle side wall,

the conical sections comprising alternating short portions and long portions, said short portions being at a greater angle to the bottle axis than said long portions, and

the lesser diameter junctures of the long portions with the short portions being formed with a wall thickness less than the side thickness of the portions to create fold rings for the circular bellows.

4,492,314

REINFORCED TANK WALL STRUCTURE FOR TRANSFORMERS

Randall N. Avery, Franklin Park, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

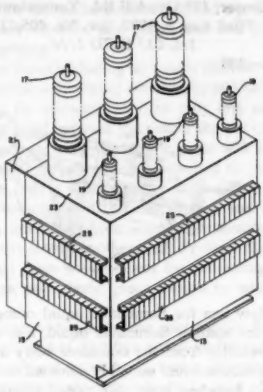
Filed Mar. 28, 1984, Ser. No. 594,058
Int. Cl.³ B65D *7/42*
U.S. Cl. 220—71 **10 Claims**

6. A reinforced structure for resisting deflections of a tank wall that is subjected to a range of positive and negative pressures within the tank, comprising:

(a) tank means for containing fluids and comprising a tank wall; and

(b) brace means mounted on the wall for stiffening the wall and including a plurality of spaced brace members dis-

posed in general alignment so that upon limited deflection of the wall the brace members move into contact to



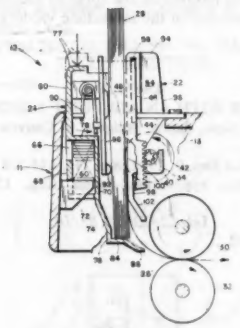
thereby increase wall resistance to additional damaging deflection.

4,492,315

MAILING MACHINE CUT TAPE FEED MODULE

Clinton E. Hooper, Brookfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 22, 1982, Ser. No. 421,698
Int. Cl.³ B65H 3/06
U.S. Cl. 221—186 **6 Claims**



1. A cut tape feed module for use with a mailing machine, comprising:

a stationary mounting and cassette support;

a driven pinion rotatably mounted on said mounting and cassette support;

a drive roller drivingly connected to said driven pinion; and

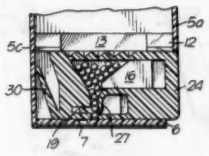
a movable, cut tape cassette slidably mounted on said mounting and cassette support, said cassette having a gear rack for driving engagement with said pinion and a biased backing plate for urging the cut tape against the drive roller, wherein downward movement of the cassette causes rotation of the drive roller which in turn effects separation of the forwardmost cut tape and dispensing thereof from the cassette, the downward movement of the cassette and the rotation of the drive roller both being in the same direction as the movement of the cut tape being dispensed.

4,492,316

TABLET DISPENSER

Norman R. Emms, Welwyn Garden, England, assignor to The Boots Company PLC, Nottingham, England

Filed Oct. 25, 1982, Ser. No. 436,555
Claims priority, application United Kingdom, Oct. 24, 1981, 8132142
Int. Cl.³ B65G 59/06
U.S. Cl. 221—202 **3 Claims**



1. A dispenser for dispensing tablets one at a time which comprises

an outer casing containing a reservoir in which the tablets are randomly orientated,

means for causing the tablets to be transferred from the reservoir and to become arranged in a single layer in a chamber which feeds the tablets into a dispensing passageway which is of such a width that only a single column of abutting tablets can be accomodated,

a slider mechanism, having portions which define the width of the dispensing passageway, said slider mechanism being moveable within the outer casing from a first position in which the column of abutting tablets is contained within the outer casing and a second tablet dispensing position in which the column of abutting tablets is aligned with a dispensing opening in the outer casing, said slider mechanism being provided with means whereby it is urged towards the first position,

a projection which is fixed in position relative to the outer casing in such a position that the projection is not aligned with the column of abutting tablets when the slider mechanism is in its first position but, when the slider mechanism is in its second dispensing position, the projection is aligned with the column of abutting tablets and is interposed between the tablet adjacent the dispensing opening and the remaining tablets in the column to retain the remaining tablets within the passageway so that only the tablet adjacent the dispensing opening can pass through that opening,

said means for causing the tablets to be transferred comprising a serrated portion of the slider mechanism which is located adjacent the exit from the reservoir and which, as the slider mechanism is moved between the first position and the second, agitates the tablets near the exit and causes some of the tablets to attain the correct orientation to fall into the chamber, and

one of said portions of the slider mechanism which define the width of the dispensing passageway being resilient so that in the event of a tablet being trapped between said one of said portions and the projection, said one of the portions will deform to minimize damage to the tablet as the slider mechanism is moved from the first to the second position.

4,492,317

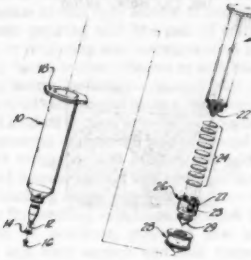
PRESSURIZING SYRINGE

Joe F. Guess, and Thomas Pearce, both of Littleton, Colo., assignors to Technicare Corporation, Solon, Ohio

Filed Aug. 19, 1982, Ser. No. 409,700
Int. Cl.³ B67D 5/06
U.S. Cl. 222—39 **11 Claims**

1. In a syringe, including a hollow barrel section which

contains a plunger assembly, a needle located at the distal end of said barrel section, and a fluid compartment located between said plunger assembly and said needle, wherein said plunger assembly includes a plunger, and a piston located between said plunger and said fluid compartment; the improvement comprising:



a snapdome located between said plunger and said piston, said snapdome deforming upon the attainment of a predetermined pressure within the fluid compartment to provide an audible indication thereof to a user.

4,492,318

WATER PISTOL

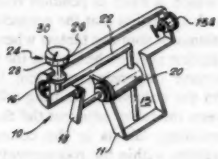
Ka-Shiu Luk, Hong Kong, Hong Kong, assignor to Heep Tung Manufactory Limited, Kowloon, Hong Kong

Filed Jul. 26, 1982, Ser. No. 402,005

Claims priority, application United Kingdom, Aug. 5, 1981, 8123953

Int. Cl.³ A63H *3/18*

U.S. Cl. 222—79 **7 Claims**



1. A toy water pistol comprising:

a hollow body in the shape of a gun to constitute a water reservoir, said body including,

a gun barrel,

a grip,

a simulated muzzle mounted on said gun barrel through which it can be assumed that a jet of water will issue,

a round knob-like member mounted above said gun barrel having,

a cylindrical wall with a water outlet formed therein said water outlet being of such dimensions and located in said cylindrical wall in such a manner as not to be obviously visible to an observer; and

means to allow said knob-like member to rotate through 360° whereby the user can turn said knob member to place the outlet in any desired or arbitrary orientation relative said barrel and simulated muzzle,

wherein the pistol further includes

a trigger, and

a pump capable of pumping water from said hollow body to the water outlet in said cylindrical wall on operation of said trigger, whereby a jet of water is emitted in a direction which is not obvious to people who are potential targets, including the user.

4,492,319

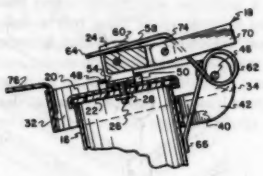
METHOD AND APPARATUS FOR ENHANCING THE FIRE COMBATANT PROPERTIES OF SAFETY CANS

Clinton T. Cooper, 105 Overhill Rd., Youngstown, Ohio 44512

Filed Aug. 9, 1982, Ser. No. 405,021

Int. Cl.³ B67D *1/16*

U.S. Cl. 222—108 **8 Claims**



1. In a safety can for flammable liquid comprising a container body for holding flammable liquid, a spout projecting generally upwardly from the container body and having an opening, a closure member movably mounted on the safety can for movement between open and closed positions for selectively opening and closing the spout opening, and means for biasing the closure member toward its closed position but capable of being overcome by pressure within the container beyond a predetermined value to allow the closure member to lift sufficiently from its closed position to form a substantially annular orifice through which contents of the safety can may spray to relieve such pressure, the improvement comprising skirt means mounted on the safety can and having the form of a strip of sheet material that defines an upwardly and downwardly opening, generally tubular skirt that substantially surrounds but is spaced from the orifice for intercepting the spray pattern created when the closure member moves from its closed position under the influence of pressure within the container, and for redirecting the spray of escaping fluid such that it will accumulate in the immediate vicinity of the safety can.

4,492,320

DISPENSER WITH AN AIR PUMP MECHANISM

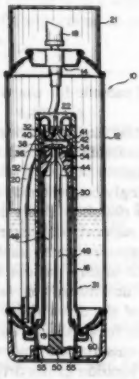
Tetsuya Tada, Tokyo, Japan, assignor to Canyon Corporation, Tokyo, Japan

Filed Sep. 9, 1982, Ser. No. 416,305

Claims priority, application Japan, Sep. 17, 1981, 56-137795[U]

Int. Cl.³ B65D *83/14*

U.S. Cl. 222—398 **6 Claims**



1. A dispenser with an air pump mechanism for dispensing

liquid in a container by utilizing compressed air accumulated previously in the container through a pressure accumulating valve attached to an internal end of a cylinder by sliding a piston in the cylinder extended into the container, said piston having an internal end and a bottom end, and a pressure chamber being formed between said piston and said cylinder, the dispenser comprising:

an air suction valve including an axially flexible valve body, said air suction valve being attached to said internal end of said piston for allowing air flow only into said pressure chamber formed between the piston and the cylinder; and

a release means including an elastic piece which has axially flexible elasticity and which is attached to the bottom of said piston, and a stem member having one end thereof fixed to the bottom of the elastic piece and another end extending into the piston, said stem member having a pushing part at said another end to release the air suction valve apart from a valve seat by contacting said valve body when said elastic piece moves to said air suction valve;

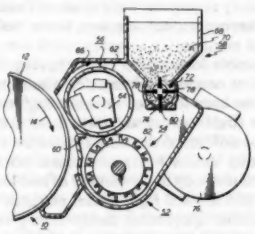
said air suction valve including said axially flexible valve body, a deformable skirt-like seal piece formed around the periphery of said valve body, and a plurality of flexible pieces coupling said valve body to said skirt-like seal piece, said axially flexible valve body being adapted to contact said valve seat in a watertight manner, and wherein a deformation of said skirt-like seat piece permits air flow into said pressure chamber.

4,492,321

APPARATUS FOR DISPENSING TONER PARTICLES AND SEALING THE STORAGE CHAMBER THEREOF

John D. Zoltner, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 22, 1982, Ser. No. 443,402
Int. Cl.³ G01F *11/20*
U.S. Cl. 222—410 **14 Claims**



1. An apparatus for discharging particles, including:

means, defining a chamber having at least one open end, for storing a supply of particles therein; and

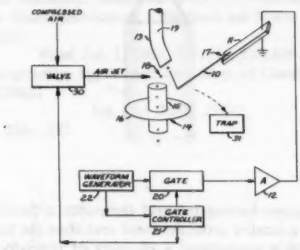
a movable brush having at least one row of bristles being of at least a size equal to the size of the open end of the chamber in said storing means and being positioned adjacent the open end of the chamber of said storing means, said brush, in the operative mode, being movable to discharge particles from the open end of the chamber in said storing means, and, in the inoperative mode, always being positioned to locate the row of bristles in the open end of the chamber of said storing means to seal the chamber of said storing means preventing the discharge of particles therefrom.

4,492,322

DEVICE FOR THE ACCURATE DISPENSING OF SMALL VOLUMES OF LIQUID SAMPLES

Gary M. Hieftje, and John Shabushnig, both of Bloomington, Ind., assignors to Indiana University Foundation, Bloomington, Ind.

Filed Apr. 30, 1982, Ser. No. 373,647
Int. Cl.³ B67D *5/00*
U.S. Cl. 222—420 **1 Claim**



1. An apparatus for accurately dispensing small volumes of a liquid sample, which comprises:

a reservoir tube with an open lower end for holding a liquid sample;

stylus means responsive to a drive signal for forming and releasing droplets of said liquid sample by insertion into and withdrawal from said open lower end of said reservoir tube;

a baffle for shielding said droplets from air movement thereby preventing deflection of the droplets from their desired trajectory, said baffle comprising a tube and a shield for catching droplets that do not pass through the tube; and

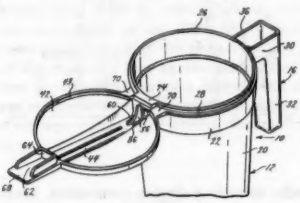
driving means for generating said drive signal for driving said stylus means.

4,492,323

WATER PITCHER

R. Eric Essen, St. Louis, Mo., assignor to Gateway Plastics, Inc., St. Louis, Mo.

Filed Nov. 9, 1981, Ser. No. 319,110
Int. Cl.³ A47G *19/14*
U.S. Cl. 222—465 R **38 Claims**



1. A pitcher for pouring liquid comprising a container portion having a top opening, a lid hinged at the top of the container portion near the periphery thereof allowing pivoting of the lid between an open position for access to the interior of the container and a closed position over the container opening, said top opening and lid being sized to expose substantially the entire interior of said container portion with the lid open, said pitcher having a spout opening near the periphery of said container portion on the same side as said hinge for the pouring of the contents therethrough.

4,492,324
CONTAINER WITH INTEGRAL FLEXIBLE NECK

Heinz Weber, 14 Lakeview Blvd., Beaconsfield, Quebec, Canada

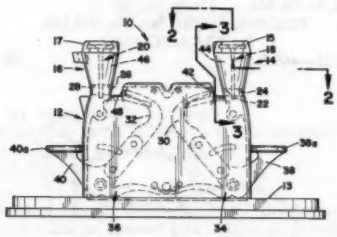
Filed Mar. 15, 1982, Ser. No. 358,048
Int. Cl.³ B67D 5/37
U.S. Cl. 222—529 12 Claims

1. A container having integral therewith a flexible neck portion with a smaller cross sectional area than the container, the neck portion comprising a plurality of specially shaped accordion ribs around the neck portion extending for at least a part of the length of the neck portion said ribs having a circular profile shaped such that when the neck portion is fully extended each of the ribs has a curved upward and inward sloping wall from an extremity of each of the ribs and a curved downward and inward sloping wall from the extremity of each of the ribs, such that an integral pouring spout at the end of the neck portion can be flexed to a flexed position from an upright position to accommodate pouring, and generally retain the flexed position, the neck portion being retractable such that the walls of the accordion ribs are substantially flat, the spout having a cap to hold the neck portion in a retracted position supported on the container.

4,492,325
NEEDLE THREADING DEVICE

Arnoldus Biemans, Mathenesserlaan 432, 3023 Hg Rotterdam, Netherlands

Filed Jul. 7, 1982, Ser. No. 396,022
Int. Cl.³ D05B 87/02
U.S. Cl. 223—99 7 Claims



1. A needle threading device comprising housing means supporting upwardly extending needle support means having an upper end and providing needle receiving cavity means having a lower end, said needle support means having a diametrically opposed pair of openings therethrough adjacent said lower end of said cavity means, needle threader means supported in said housing means for displacement in a threading direction to move a thread sequentially through one of said openings, the eye of a needle in said cavity means and thence through the other of said openings, said needle support means including means providing a thread release passageway extending therethrough from said upper end to said one opening, said needle threader means including an actuator lever supported in said housing means for pivotal movement about a fixed axis, threader member means on said actuator lever for pivotal movement therewith, pivotal movement of said actuator lever in one direction relative to said fixed axis displacing said threader member means in said threading direction, said actuator lever including actuating arm means integral therewith and extending outwardly from said housing for pivoting said actuator lever in said one direction, said actuator lever further including biasing means integral therewith and biasing said lever to pivot relative to said fixed axis in the direction opposite said one direction, said actuator lever being of inverted generally T-shaped configuration and including an upwardly extending leg portion carrying said threader member means and having a lower end, and arm portions extending in opposite directions from said lower end of said leg portion, said fixed axis being through said lower end of said leg portion, one of said arm portions extending outwardly from said housing means and providing said actuating arm means, and the other of said arm portions being flexible relative to said leg portion and having an end spaced from said axis and engaging an abutment in said housing means to provide said biasing means for said actuator lever.

4,492,326
SLING-TYPE INFANT CARRIER

Linda W. Storm, White Sands Missile Range, N. Mex., assignor to Babies by Storm, Inc., Springfield, Ohio

Filed Mar. 28, 1983, Ser. No. 479,917
Int. Cl.³ A47D 13/02
U.S. Cl. 224—160 8 Claims

1. A sling-type infant carrier, comprising:

an approximately retangular body made of flexible material, said body having respective upper, lower, left lateral and right lateral margins;

a length-adjustable lower strap means having two opposite ends and first connector means for disconnectably connecting these ends together in encircling relation to the girth of an adult user at mid-torso level for facilitating donning and doffing of the sling-type infant carrier;

said lower strap means having a central portion thereof connected to the body in the vicinity of said lower margin, at least by said left and right lateral margins;

a length-adjustable upper strap means having two opposite ends and having a central portion thereof secured to said body along said upper margin of said body;

second connector means associated with one of said ends of said upper strap means for disconnectably connecting that end to said left lateral margin of said body below where said central portion of said upper strap means is secured along the upper margin of said body, with a respective portion of said upper strap means adjoining said second connector means, obliquely crossing the adult user's torso and extending over the adult user's right shoulder to the right lateral margin of said body;

third connector means associated with the other of said ends of said upper strap means for disconnectably connecting that end to said right lateral margin of said body below where said central portion of said upper strap means is secured along the upper margin of said body, with a re-

spective portion of said upper strap means adjoining said third connector means, obliquely cross the adult user's torso and extending over the adult user's left shoulder to the left lateral margin of said body;

said upper strap means being stuffed with pillow stuffing material along the width of said upper margin of said body and along adjoining portions thereof extending laterally leftwards and rightwards beyond the respective lateral margins of said body so as to provide a pillow which is substantially more laterally extensive than is said body at said upper margin, with said pillow thereby extending over where said upper strap means is disconnectably connected by said second and third connector means to said left and right lateral margins of said body;

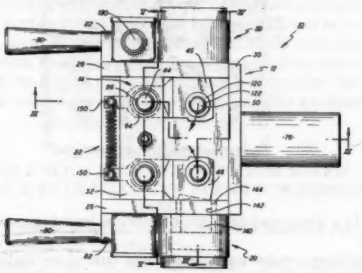
whereby said body is constructed and arranged to be supported sling-fashion on the torso of the adult user between the upper strap means and the lower strap means.

4,492,327

TUBE PULLING APPARATUS

Gregory W. Martin, Rochester, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 21, 1981, Ser. No. 303,796
Int. Cl.³ B65H *17/20*
U.S. Cl. 226—177 **3 Claims**



1. A tube pulling apparatus comprising:

frame means for receiving a tube;

a pair of arm means each pivotably mounted to, and located within, said frame means;

a pair of tube gripping means each rotatably supported within one of said pair of arm means at one end thereof and moved by said arm means into and out of engagement with the tube, wherein each of said pair of tube gripping means is of a generally cylindrical shape with a concave outside surface having a plurality of helically extending raised threads extending from said concave surface whereby a tube is rotated as well as moved axially;

a pair of motive means each engageable with said one end of one of said pair of arm means for moving said one end of each of said arm means to move said pair of tube gripping means into engagement with the tube;

biasing means connected to the other end of both of said pair of arm means for urging said other ends of said pair of arm means together to thereby tend to move said pair of tube gripping means out of engagement with the tube;

drive means connected to said pair of tube gripping means for rotating said pair of tube gripping means to thereby pull the tube;

each of said pair of arm means includes a pivot pin supported by said frame means and defining a pivot axis;

a pivot arm supported for pivotal movement about said pivot axis;

said drive means includes

a pair of drive gears supported for rotation about each of said pivot axes; and

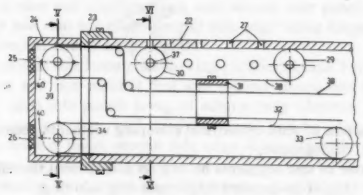
a pair of driven gears each connected to both of one of said drive gears and one of said tube gripping means for transmitting rotary motion therebetween.

4,492,328

AIR-FLOW EQUIPPED TURNING BAR FOR WEB MATERIAL

Wilhelm Münnich, and Manfred Batke, both of Augsburg, Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,309
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1982, 3225922
Int. Cl.³ B65H *23/32*
U.S. Cl. 226—197 **15 Claims**



1. Air-flow equipped turning bar for changing the path of a web, particularly of a web of printed material, having

a tubular, hollow structure (**1, 22**) connected to a source of air under pressure above atmospheric to subject the interior thereof to overpressure;

a plurality of air exit holes (**4, 27**) located in at least one axial row along the circumference of the hollow structure;

and means for closing off selected ones of said holes, comprising, in accordance with the invention,

a flexible ribbon or tape (**5, 5', 28, 32, 38**) located in the tubular structure close to the wall of the tubular structure through which the holes extend, said ribbon or tape, extending axially within the hollow tubular structure and being formed with a longitudinal slit (**90**) shorter than the length of the tape;

and positioning means (**15, 13, 14, 16, 17, 18, 31, 34, 39, 40, 43, 44**) coupled to the ribbon or tape axially moving the ribbon or tape, and for selectively positioning under selected ones of said holes (**4, 4', 27**) and slit (**90**) or a solid portion of the ribbon or tape, to permit, selectively, escape of pressurized air from the hollow interior of the tubular structure through the slit and the holes, or blocking of the holes by a solid portion of the ribbon or tape by engagement of the ribbon or tape against portions of the tubular structure surrounding the holes under force of the overpressure in the interior of the tubular structure, to seal the ribbon or tape against the interior walls of the tubular structure.

4,492,329

POWDER ACTUATED TOOL

John Benson, Sherwood; Harold L. Hanel, and Douglas A. Freeman, both of Portland, all of Oreg., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 322,569, Nov. 18, 1981,. This application Jun. 11, 1984, Ser. No. 619,364
Int. Cl.³ B25C *1/14*
U.S. Cl. 227—10 **4 Claims**

1. A tool for explosively driving an elongated fastener into a work surface comprising:

a barrel housing having a barrel slidably mounted therein;

a piston slidable in said barrel, said piston having a head on the rear thereof;

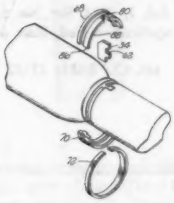
an axial slot in the wall of said barrel;

an axial slot in the wall of said housing radially aligned with said barrel slot;

a return dog extending inwardly through said slots in front of said head for limiting forward movement of said piston in said barrel; and

retention means for releasably retaining said return dog in said slots, said retention means comprising:

an annular groove in the outer surface of said housing behind said dog;



a pair of semi-cylindrical clamping segments positioned in said groove;

one of said segments having an axial cutout therein opening at its forward edge receiving said dog;

said cutout being located between 30° and 60° from one end of said one segment; and

releasable spring means holding said segments in said groove.

4,492,330

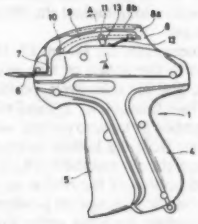
FASTENER ATTACHER

Akira Furutsu, Tokyo, Japan, assignor to Japan Bano'k Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1982, Ser. No. 344,593

Int. Cl.³ A41H *37/00*

U.S. Cl. 227—67 **8 Claims**



1. A fastener attaching device for loading and dispensing an assembly of fasteners, each fastener having a head, a crossbar, a filament connecting together the head and the crossbar, a neck disposed normal to the crossbar and extending away from the head, connecting rods disposed at the end of the fastener neck opposite the crossbar and extending normal to the neck and crossbar, the connecting rods of the fasteners being integrally joined and interconnecting the fasteners to form the assembly, said attaching device comprising:

means for individually dispensing said fasteners including an attachment mechanism, and

means, disposed along an upper surface of said dispensing means, for holding said fastener assembly, said holding means includng a first wall extending upwardly from, and substantially normal to, said dispensing means upper surface, and a second wall extending normal to said first wall and overlaying said upper surface,

said first and second walls defining means for guiding said fastener assembly connecting rods to said attaching mechanism,

said second wall including surface means, disposed parallel to said first wall, for supporting said crossbars of said fastener assembly,

said surface means comprising a third wall extending toward said upper surface parallel with said first wall, said third wall including a surface facing said upper surface and abutting the necks of said fasteners, said third wall being positioned between said crossbars and said connecting necks of said fastener assembly.

4,492,331

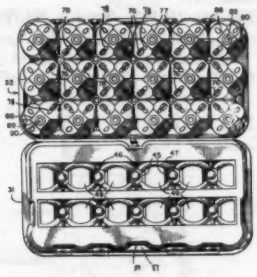
MULTI-ROW EGG CARTONS

Kenneth D. Bixler, Huntington, N.Y.; Richard F. Reifers, New Canaan, Conn., and Henry A. Lord, Cape Elizabeth, Me., assignors to Packaging Corporation of America, Evanston, Ill.

Filed Sep. 29, 1981, Ser. No. 306,981

Int. Cl.³ B65D *1/00*

U.S. Cl. 229—2.5 EC **14 Claims**



1. In a windowed egg carton having at least two rows of egg cells,

a cellular tray having a longitudinal row of upstanding posts,

a carton cover hingedly connected to said cellular tray and including

at least two sets of spaced rails with one set arranged at right angles to the other set with a windowed structure formed between at least one set,

said windowed structure including a plurality of openings,

at least two interengaging formations located below the level of said rails and supported on top portions of a corresponding number of said upstanding posts,

channel walls with vertical pilaster ribs extending upwardly and outwardly from opposite sides of the periphery of said interengaging formation to one of said sets of spaced rails forming a strengthened structure supporting said rails on said upstanding posts under vertical loading,

at least one of said pilaster ribs being disposed within a plane extending substantially transversely of the row of posts formed in said tray and intersecting a post of said row.

4,492,332

CARTON DIVIDER

Thomas D. Collins, Kennesaw, Ga., assignor to Sonoco Products Company, Hartsville, S.C.

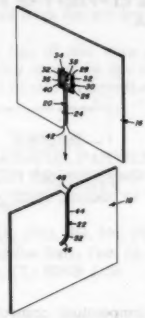
Filed Dec. 23, 1983, Ser. No. 565,200

Int. Cl.³ B65D *5/48*

U.S. Cl. 229—15 **8 Claims**

1. In a carton divider comprising a pair of planar partitions having cooperative vertical slots for an intersecting of said partitions; the slot in one partition having an inner portion and an outer portion, said inner portion being enlarged and defined by an inner edge and opposed side edges, tab means within said inner portion and including an inner end attached to the inner edge of the inner portion, said tab means being coplanar with

said one partition and laterally flexible out of the plane of the one partition about the inner edge, said tab means being of greater width than the outer portion of the slot and including an outer end spanning the outer portion of the slot, said tab means including a pair of laterally spaced coplanar side bars defining a central opening therebetween aligned with the outer portion of the slot; the slot in the other partition having an



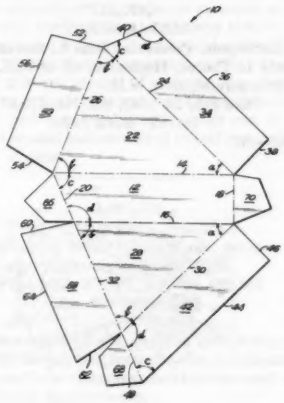
outer portion internestable with the outer portion of the slot of the one partition, and an inner portion laterally extending from the outer portion of the slot of the other partition at an angle sufficient, upon advancing engagement with said outer end of the tab means, to laterally guide the tab means along the inner portion of the slot of the other partition and position the tab means side bars to the opposite sides of the other partition.

4,492,333

SINGLE SLICE PIE CARTON WITH SLANTED OPENABLE REAR WALL AND BLANK FOR FORMING SAME

Harry H. Roberts, Roswell, Ga., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 411,523, Aug. 25, 1982, abandoned.
This application Jan. 23, 1984, Ser. No. 572,618
Int. Cl.³ B65D *5/00*
U.S. Cl. 229—22 **9 Claims**



1. A paperboard blank for forming a wedge shaped carton having an openable slanted rear wall, said blank comprising:

a trapezoidal first side panel having parallel top and bottom edges and non-parallel first and second side edges, said first side edge being substantially perpendicular to said top and bottom edges, and said top edge being longer than said bottom edge;

an isosceles triangular top panel having first and second equal side edges and a base edge, said top panel first side edge and said first side panel top edge being hingedly connected and of equal length;

an isosceles triangular bottom panel having first and second equal side edges and a base edge, said bottom panel first side edge and said first side panel bottom edge being hingedly connected and of equal length, the angle between said first and second side edges of said top panel being equal to the angle between the first and second side edges of said bottom panel;

a trapezoidal second side panel having parallel top and bottom edges and non-parallel first and second side edges, said first and second side panels being substantially identical in size and configuration, said second side panel top edge and said top panel second side edge being hingedly connected and of equal length;

a trapezoidal third side panel having parallel top and bottom edges and non-parallel first and second edges, said first and third side panels being of substantially identical size and configuration, said third side panel bottom edge and said bottom panel second side edge being hingedly connected and of equal length;

an isosceles trapezoidal top flap having parallel top and bottom edges and non-parallel side edges, said top flap top edge and said top panel base edge being hingedly connected and of equal length, said top flap bottom edge and said bottom panel base edge being of substantially equal length and said top flap side edges and said first side panel second edge being of substantially equal length; and

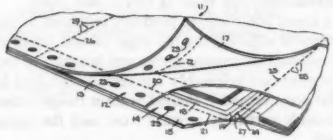
an isosceles trapezoidal bottom flap having parallel top and bottom edges and non-parallel side edges, said bottom flap and said top flap being of substantially identical size and configuration, said bottom flap bottom edge and said bottom panel base edge being hingedly connected and of substantially equal length, whereby the carton formed from said blank includes a double side wall and a double slanted rear wall for protecting a slice of pie stored therein.

4,492,334

TENTLESS CONTINUOUS MAILER ASSEMBLY

David Dicker, Scarsdale, N.Y., assignor to Transkrit Corporation, Elmsford, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,697
Int. Cl.³ B65D *27/10*
U.S. Cl. 229—69 **9 Claims**



1. A continuous mailer assembly comprising

a plurality of interconnected units disposed in stacked array, each unit including a front ply, a back ply secured to said front ply to define an envelope and at least one insert ply between said front ply and said back ply;

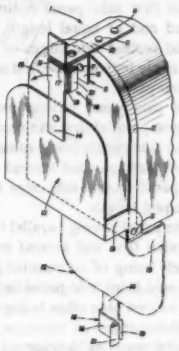
one of said front ply and said back ply of one of said units being unconneted and contiguous with one ply of an adjacent unit and the other of said front ply and said back ply being connected with another ply of said adjacent unit in an interrupted manner.

4,492,335

MAILBOX SIGNALING DEVICE

Bobby V. Davis, 2057 Rathburn Rd., Wooster, Wayne County, Ohio 44691

Filed Nov. 9, 1983, Ser. No. 549,917
Int. Cl.³ B65D 91/00
U.S. Cl. 232—35 3 Claims



1. A mail delivery-indicating signaling device for a mailbox of the type having a box provided with an open end, a flanged door for said open end having a pivot mounting at the bottom door edge on the mailbox for movement between open and closed positions with respect to said box open end, and latch means normally holding the door in closed position; in which the latch means includes an L-shaped bracket mounted on the door adjacent the top door edge projecting outward of the door releasably engageable with a bracket mounted on the box; in which said L-shaped bracket has a flat downturned flange spaced outward of and oriented parallel to said door adapted to be engaged by the mailman and pulled outwardly to open the door on said pivot mounting; in which the mailbox is provided with a mail pickup signal device; and in which the mailbox is provided with a mail delivery signaling device actuated or released for movement to signaling position upon movement of the door to open position; wherein the improvement comprises:

(a) a generally flat mail delivery-indicating signal member pivotally mounted on the mailbox for movement between signaling and nonsignaling positions independently of opening and closing movements of the mailbox door and having a contour similar to that of the mailbox door and also having a height less than that of said door and a width substantially the same as that of said door;

(b) a signal control strap pivotally mounted on the flat signal member adjacent the top edge of said signal member for rotational movement above and laterally of the flat signal member and releasably connected with said latch means flat downturned L-shaped bracket flange when said strap extends vertically upward from said flat signal member; and

(c) said strap having actuating flange means adapted to be pressed by a mailman to rotate said strap to disconnect said strap from said flat downturned bracket flange to permit said signal member to rotate on its pivotal mounting independently of mailbox door movement to a mail delivery-indicating position below said door, before the door is opened by the mailman pulling said flat downturned bracket flange to deliver mail into said box;

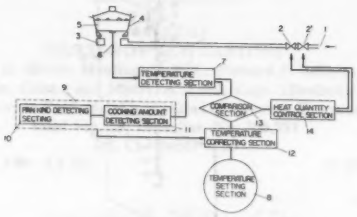
(d) whereby said door may be opened and closed by the mailman without disconnecting said flat signal member to pick up mail in the box.

4,492,336

COOKER WITH HEATING CONTROL SYSTEM

Manabu Takata, Yamatokoriyama; Shojiro Inoue, Nara, and Keiichi Mori, Izumiotsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 9, 1983, Ser. No. 473,437
Claims priority, application Japan, Mar. 17, 1982, 57-43469; Apr. 13, 1982, 57-61585; Apr. 14, 1982, 57-62745
Int. Cl.³ F23N 1/08; F24C 3/00
U.S. Cl. 236—20 A 23 Claims



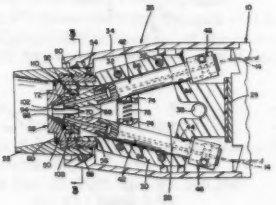
1. A cooking temperature control system comprising: a means for heating food to be cooked, a temperature detecting section for detecting the temperature of a temperature sensor in contact with the bottom of a pan, a temperature presetting section that can be preset as desired, a temperature correcting section for correcting a preset temperature by a pan kind detecting section attached to said temperature detecting section for detecting the temperature rise gradient of the pan bottom, and a heat quantity control section for delivering a control signal to a heating control means for controlling the heating rate of said heating means, wherein the temperature signal from said temperature detecting section and the temperature corrected by said temperature correcting section are compared with each other in a comparing section which is operatively connected to said heat quantity control section, and wherein the heat quantity control section increases or decreases the amount of heat generated by said heating means and controlled by said heating control means or stops it so as to maintain the temperature of the food at a constant value.

4,492,337

METAL SPRAY

Kent W. Harrington, Pembroke; John L. Stevens, Dunbarton, and Merle L. Thorpe, Hopkinton, all of N.H., assignors to TAFA Incorporated, Bow, N.H.

Filed Feb. 28, 1983, Ser. No. 470,071
Int. Cl.³ B05B 1/24
U.S. Cl. 239—81 19 Claims



10. In a metal spray device of the arc spray type,

alignment structure of electrically insulating material that defines a through passage,

said alignment structure being disposed between a gas inlet and an arc zone such that a primary stream of gas is arranged to flow through said through passage,

seat surfaces on the walls of said through passage,

individual wire guides for each wire to be sprayed, each said wire guide being adapted to guide a metal wire therethrough towards an arc zone forward of said alignment structure,

means for connecting said wire guides to a source of electric current for establishing an electric arc between the ends of the wires at said arc zone,

a gas inlet for flowing a primary stream of gas through said through passage into the arc zone to cause molten metal particles to be carried from the arc zone for deposit on a substrate, and

means for urging the tips of said wire guides outwardly away from one another to seat the tips of said wire guides on said seat surfaces of said alignment structure.

4,492,338

ULTRASONIC APPARATUS, PARTICULARLY FOR LIQUID PROCESSING

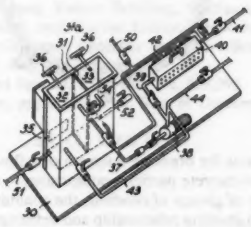
Ernesto Marelli, Monza, Italy, assignor to Ottorino Sparano, Cernobbio, Italy

Filed Feb. 16, 1982, Ser. No. 349,237

Claims priority, application Italy, Feb. 26, 1981, 20006 A/81

Int. Cl.³ B05B *1/08*

U.S. Cl. 239—102 **4 Claims**



1. An ultrasonic assembly for the ultrasonic treatment of liquids comprising a pre-atomizer having a casing and a partition wall in the casing defining two chambers, a bridge conduit having a first end connected to a first of said chambers and another end connected to a second of said chambers, a final atomizer located downstream of said pre-atomizer and having an outlet end, piezoelectric transducers mounted on said pre-atomizer and said final atomizer, a pumping element having a suction conduit and a delivery conduit, said suction conduit of said pumping element being connected to one of said chambers, and said delivery conduit of said pumping element being connected to said final atomizer, and a recirculation conduit having a first end connected to said outlet end of said final atomizer and a second end connected to said suction conduit of said pumping element.

4,492,339

FLOW CONTROL NOZZLE

Jeffrey P. Kreitzberg, Walla Walla, Wash., assignor to Nelson Irrigation Corporation, Walla Walla, Wash.

Filed Mar. 2, 1983, Ser. No. 471,331

Int. Cl.³ B05B *3/02*

U.S. Cl. 239—230 **19 Claims**

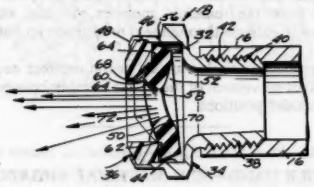
1. A nozzle assembly for a sprinkler comprising a resilient annular washer having and upstream side, a downstream side, an exterior periphery extending therebetween and an interior opening extending therebetween,

a rigid structure cooperatively receiving said washer, said rigid structure having means for enabling the same to be detachably secured to a sprinkler so as to communicate water under pressure within the sprinkler with the upstream side of said washer,

said rigid structure including peripheral surface means generally confining the periphery of said washer so as to determine generally the relative radial position at which said washer is presented for communication with the water under pressure within the sprinkler when said rigid structure is secured thereto,

interengaging surface means on the downstream side of said washer and on said rigid structure for enabling said washer to be controllably distorted by the water under pressure communicated with the upstream side thereof such that the periphery of the downstream face remains generally in the aforesaid relative radial position while the remainder is distorted axially in the downstream direction an amount which increases progressively in a direction toward said interior opening,

said washer having stream defining surface means at the juncture between said interior opening and said upstream side for engaging the water under pressure communicated



with the upstream side of the washer and forming the same into a stream issuing through said opening having a cross-sectional area and velocity which vary inversely with respect to one another depending upon the pressure of the water under pressure communicated with the upstream side of the washer so that the water flow rate within the stream is generally constant within an operative range of pressures,

said stream defining surface means when distorted as aforesaid including at least one annular portion which is disposed axially upstream with respect to another annular portion thereof such that one portion of the stream engaged by said one surface means portion has a greater radially outward component of movement as compared with another portion of the stream engaged by said other annular surface means portion thus resulting in a greater diffusion of said one stream portion with respect to said other stream portion.

4,492,340

VALVE ARRANGEMENTS FOR PROPULSIVE FLUID

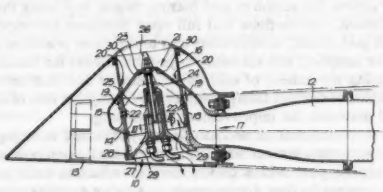
Geoffrey H. Fieldus, Kingston-upon-Thames, England, assignor to British Aerospace Public Limited Company, London, England

Filed Oct. 8, 1982, Ser. No. 433,444

Claims priority, application United Kingdom, Oct. 12, 1981, 81306617

Int. Cl.³ B64C *15/00*; F02K *1/00*

U.S. Cl. 239—265.25 **11 Claims**



1. A valve arrangement for controlling the flow of a propul-

sive fluid in a reaction control system, said arrangement being adapted to receive propulsion fluid in a given direction and to controllably exhaust it in a direction generally perpendicular to said given direction, said valve arrangement comprising:

a generally muff-shaped manifold member, including manifold inlet means extending generally radially away therefrom and adapted to receive propulsion fluid from a propulsion fluid source and having a wall defining a cylindrical bore extending generally perpendicular to said inlet means, said wall also defining, adjacent one end of said bore, annular slot means through which propulsion fluid may leave said manifold;

propulsion jet outlet means arranged substantially coaxially with respect to said bore and being in flow communication therewith;

a piston member slidably received in said bore for movement between a closed position in which it sealingly closes said annular slot means and an open position in which said annular slot means is opened to allow propulsive fluid to pass from the manifold member via said annular slot means to exhaust through said propulsion jet outlet means; and

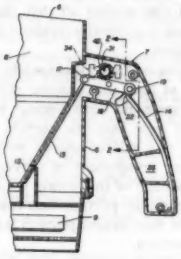
actuator means coupled to said piston member and operable to effect movement of the piston member between its open and closed positions.

4,492,341

PORTABLE HAND-HELD MATERIAL BROADCASTING DEVICE

Francis F. Allen, Moraga, Calif., assignor to Bermuda Research Corp., Orinda, Calif.

Filed Jan. 28, 1983, Ser. No. 461,943
Int. Cl.³ A01C *17/00*
U.S. Cl. 239—686 **2 Claims**



1. In a portable handheld material broadcasting device, a housing having a manually engageable handle and providing a storage chamber for flowable granular material superimposed over a normally horizontally rotating impeller and having a discharge opening for gravitational flow of material from said chamber to said impeller, a valve member mounted for reciprocation across said opening for regulating said material flow and having closed, intermediate and full open positions, means biasing said valve member to closed position, a manually displaceable actuating member positioned adjacent said handle and having a connection for displacement of said valve member against the action of said biasing means, and being movable to closed, intermediate and full open positions corresponding with said closed, intermediate and to full open positions of said valve member, and manually adjustable means for limiting the opening movement of said valve member and corresponding position of said actuating member for setting the rate of flow of said material; the improvement comprising:

a stop mounted on said handle and positioned to engage said actuator member when moved to its full open position and to support said actuator member when in such position against further displacement in a valve opening direction; and

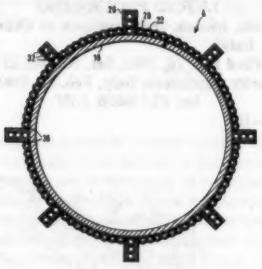
said connection being resiliently yieldable to permit forced displacement of said actuator member to said stop and without damage to said connection when said valve opening adjusting means is set at an intermediate valve open position.

4,492,342

CENTRIFUGAL DRUM FOR METALLURGICAL SLAG

Clement Burton, 42, rue Mathias Koener, Esch sur Alzette; Andre Kremer, 15, bld. Pierre Dupong, Luxembourg; Hubert Stomp, 11, rue Speyer, Howald, and Marc Solvi, 56, rue des 3 Cantonst, Ehlange s/Mess, all of Luxembourg

Filed Dec. 2, 1981, Ser. No. 326,922
Claims priority, application Luxembourg, Dec. 12, 1980, 83000
Int. Cl.³ B02C *13/06, 13/26*
U.S. Cl. 241—67 **15 Claims**



1. Apparatus for breaking a stream of inflowing coagulated material into discrete particles comprising:

a plurality of groups of conduits, the conduits of each group being in abutting relationship and defining a portion of the outer surface of a cylinder, said cylinder having a length in the axial direction;

each of said conduits substantially extending said length of said cylinder in said axial direction beater bar means positioned between each of said groups of conduits, said beater bar means including portions which extend outwardly with respect to the surface of said cylinder, opposite side surfaces of each of said beater bar means being in abutting relationship with an outermost conduit of respective adjacent conduit groups, rotation of the cylinder defined by said conduits about its axis causing said beater bar means to impact upon and fracture material which is caused to come in contact therewith;

means for delivering a coolant to first ends of said conduits, said coolant delivering means including a common distribution chamber; and

coolant collection means, said collection means being in fluid communication with the second end of each of said conduits and including a common collection chamber.

4,492,343

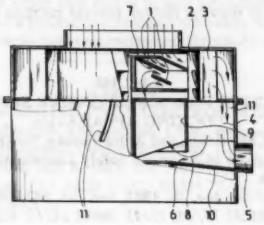
WOOD CHIP SHAVING MACHINE

Matti Jaakonmäki, and Pentti Raura, both of Valko, Finland, assignors to Rauma-Repola Oy, Finland

Filed Jan. 10, 1983, Ser. No. 456,742
Claims priority, application Finland, Jan. 28, 1982, 820285
Int. Cl.³ B02C *13/16*
U.S. Cl. 241—95 **4 Claims**

1. Wood chip shaver comprising a rotor, a chip guide plate on said rotor, circumferential blades disposed around the outside of said rotor, an annular interspace formed outside and below said circumferential blades to receive shavings cut from wood chips, a discharge aperture communicating with said annular interspace through which the shavings leave said

interspace, and at least one air passage provided on the margin of said interspace and in the chip guide plate of the rotor



through which an air flow created by the rotor can rejoin circulation in the shaver.

4,492,344

FIXTURE FOR A WIRE IN A WIRE-WINDING DEVICE FOR AN ELECTRIC MACHINE

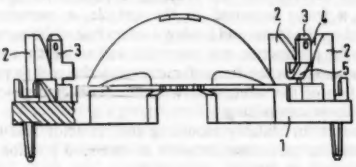
Fritz Baumann; Ernst Kränzler; Siegmund Radke, all of Leinfelden-Echterdingen; Rainer Schilling, Stuttgart; Wolfgang Fuchs, Filderstadt, and Werner Rieker, Steinenbronn, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,991

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3150970

Int. Cl.³ F16C *25/00*

U.S. Cl. 242—1 **10 Claims**



1. A fixture for use in a wire-winding device for winding electric machines, which is mounted at a front face of a stator pack of the electric machine and is insulated thereform, comprising a connection clip for a wound wire end; a groove-shaped wire-receiving member provided on said clip at its one side for receiving the wound wire end and having an elongated receiving slot for guiding the wire, said receiving slot of said wire-receiving member having an axis of elongation and insertion means provided at the opposite side of said clip and having an elongated insertion slot for inserting the wire, said insertion slot extending at an angle with respect to said axis of elongation for inserting the wire into said elongated insertion slot, then passing the wire to said clip at the angle, and thereafter receiving the wire into said elongated receiving slot.

4,492,345

PAPER ROLL REWINDER

William J. Bakker, P.O. Box 128, Caledon, Ontario, Canada L0N 1C0

Filed Aug. 6, 1982, Ser. No. 405,769

Claims priority, application Canada, Aug. 7, 1981, 383453

Int. Cl.³ B41J *15/16*; B65H *17/02*

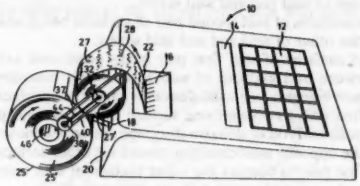
U.S. Cl. 242—67.3 R **3 Claims**

1. Apparatus for allowing a paper tape to be unwound from a first roll by a printing unit, and for simultaneously rewinding the paper tape on a second roll, each roll including a hollow cylindrical core, the apparatus comprising:

low-friction cylindrical axle means for positioning within the hollow core of the second roll,

alignment means for maintaining said axle means such that the axis of the axle means remains parallel with the axis of the second roll, and for keeping the two rolls laterally aligned,

and retention means for keeping the two rolls together, said retention means including an elastic cord member adapted to pass in a closed loop through the hollow core of the first roll, between the two rolls, and through a central opening in the axle means positioned in the hollow core of the second roll,



the axle means including two stub axles, each adapted to enter one end of the hollow core of the second roll, and each having an axial bore through which the elastic cord member passes,

the alignment means including an annular gallery around each stub axle, and for each stub axle a member adapted to lodge in the gallery and to extend perpendicular to the axis of the stub axle, the member being juxtaposed and urged against the respective end of both rolls by the elastic cord member, thus maintaining the rolls laterally aligned, the two members being separate and independent of one another, and linked only by the elastic cord member.

4,492,346

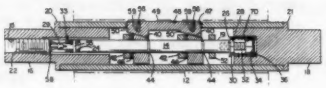
POSITIVE RETRACTING MECHANICAL EXPANSIBLE SHAFT

Lawrence C. Young, So. Easton, Mass., assignor to Double E Company Inc., Brockton, Mass.

Filed Feb. 28, 1983, Ser. No. 470,143

Int. Cl.³ B65H *75/24*, *54/54*

U.S. Cl. 242—72.1 **12 Claims**



1. An expansible shaft for engaging and rotating the core of a roll comprising:

an axially-extending housing;

an operating rod mounted coaxially of said housing and arranged for movement axially relative to said housing;

a core engager movable radially relative to said housing and said operating rod between an expanded position in which said core engager extends beyond the outer wall of said housing and a retracted position in which said core engager is positioned radially within said expanded position thereof;

an actuator mounted on said rod and arranged to move axially in response to axial movement of said rod, said actuator axial movement causing said core engager to move towards said expanded position in response to axial movement of said rod;

an actuating screw threadingly engaging said housing and being rotationally and axially movable relative to said

housing, said screw being mounted coaxially of and in general axial alignment with said rod; and,

means for connecting said screw to said rod to permit relative rotation of said screw and rod and to move said rod axially in one axial direction in response to clockwise rotation of said actuating screw and in the opposite axial direction in response to counterclockwise rotation of said actuating screw,

said rotatable connecting means comprising a first pair of generally oppositely axialy facing surfaces and a second pair of generally oppositely axially facing surfaces axially spaced from said first pair of surfaces,

the surfaces of said first pair of surfaces being attached to one of said rod and said screw,

the surfaces of said second pair of surfaces being attached to the other of said rod and said screw,

said surfaces of said first pair being positioned axially between said surfaces of said second pair whereby screw movement in one axial direction causes one surface of said first pair to contact one surface of said second pair and push said rod in said one direction and screw movement in the opposite axial direction causes the other surface of said first pair to contact the other surface of said second pair and push said rod in said other direction,

said one surface of said first pair of surfaces comprising a segment of a ball surface facing in one generally axial direction, said ball being attached to one of said rod and said screw, and

said one surface of said second pair of surfaces comprising a segment of the inner surface of a socket that generally envelopes said ball and is attached to the other of said rod and said screw.

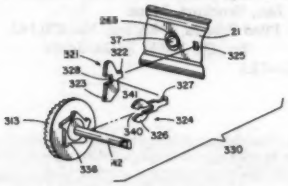
4,492,347
ANTI-REVERSE MECHANISM

Elvis W. Moss, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 398,414, Jul. 14, 1982, abandoned, which is a continuation of Ser. No. 218,920, Dec. 22, 1980, abandoned. This application Jul. 28, 1983, Ser. No. 517,735

Int. Cl.³ A01K *89/01, 89/02*

U.S. Cl. 242—84.2 R **4 Claims**



2. In a spinning reel having a body portion with a deck plate, and a fishing line retrieval mechanism having a centershaft with a first gear thereon drivably connected to a second gear on a crankshaft, the crankshaft having a handle thereon for rotation by an operator for retrieval of fishing line, an anti-reverse mechanism comprising:

a ratchet fixed for rotation with said crankshaft;

a pawl lying in a plane common with the plane of the ratchet and having

a tab and an opposing recess, said tab loosely fitting in a slot in said deck plate, and

a pawl tooth for engaging the ratchet to prevent reverse rotation of the crankshaft;

an actuator lying in a plane adjacent the plane of the pawl and ratchet, and frictional engaging the crankshaft for rotation therewith, said actuator having a tab extending transverse to the actuator plane and received in the pawl recess, whereby rotation of the crankshaft in a positive direction pivots the actuator so that the actuator tab rocks the pawl about the pawl tab to a position where the pawl tooth is free from engagement with the ratchet, and rotation of the crankshaft in the reverse direction pivots the actuator so that the actuator tab rocks the pawl about the pawl tab to a position where the pawl tooth engages the ratchet to prevent further reverse rotation of the crankshaft.

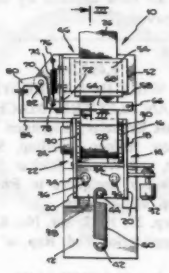
4,492,348
PROTRACTIVE FORCE RESPONSIVE SAFETY BELT LOCKING APPARATUS

Avraham Ziv, Sepulveda, and Akira Tanaka, Northridge, both of Calif., assignors to American Safety Equipment Corporation, Troy, Mich.

Filed Jan. 29, 1982, Ser. No. 343,896

Int. Cl.³ B65H *75/48, 75/42;* **B60R** *21/10;* **A62B** *35/02*

U.S. Cl. 242—107.2 **5 Claims**



1. In a locking seat belt retractor apparatus for a vehicle having a frame mounted to the vehicle, a retractor reel mounted on the frame and having a safety belt webbing wound thereon for protraction and retraction and an inertia-activated pawl mounted on the frame for engaging the reel to prevent protraction of the safety belt webbing in an emergency, the improvement comprising:

(a) means for slidably mounting the retractor reel on the frame for movement between an extended position and a retracted position;

(b) biasing means for biasing the retractor reel toward said retracted position, said retractor reel being movable to said extended position by a protraction force on the safety belt webbing exceeding a threshold amount predetermined by the bias force of said biasing means;

(c) clamping means mounted on the frame and having the safety belt webbing passing therethrough for selectively clamping the safety belt webbing against further movement relative to said clamping means, wherein said clamping means comprises a wedge-shaped clamp member and means for mounting said clamp member for movement from a webbing disengaging position to a webbing clamping position, said operating means includes, biasing means for normally biasing said clamp member toward a webbing clamping position, releasable retaining means for normally holding said wedge-shaped member against movement toward said webbing clamping position and protraction force-activated tripping means for operating said releasable retaining means to a released position whereby said wedge-shaped clamp member is moved by said biasing means to said webbing clamping position, said means for mounting said wedge-shaped clamp member includes a pivotally-mounted support bar underlying said wedge-shaped clamp member and said biasing means comprises a spring operably connected to said support bar, and said releasable retaining means comprises a bell-crank linkage operably connected between said protraction force-activated tripping means and said support bar whereby said linkage normally holds said bar against the

bias of said spring and is released by rotation thereof by said protraction force activated tripping means; and,

(d) operating means operably connected to said clamping means and said reel for operating said clamping means to clamp the safety belt webbing against further relative movement when said reel is in said extended position in response to a protractive force on the safety belt webbing which exceeds said predetermined threshold amount.

4,492,349

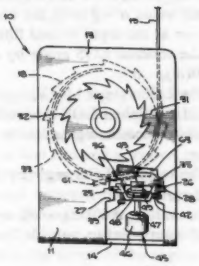
PROGRAMMED PAWL CONTROL MEANS

Nazareth Stamboulian, Los Angeles, Calif., assignor to American Safety Equipment Corporation, Troy, Mich.

Filed Sep. 8, 1981, Ser. No. 299,940

Int. Cl.³ A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.4 A **6 Claims**



1. In an automatically locking safety belt retractor for use with safety harnesses employed for restraining passengers in their seat in vehicles wherein the retractor includes a belt storage spool rotatably mounted by a spool axle in a retractor frame, one or more ratchet wheels mounted on said axle, a locking bar with one or more pawl teeth for engaging said one or more ratchet wheels to lock said axle and spool against belt protraction movement, programming means for operating said locking bar into engagement with said one or more ratchet wheels and including a programming ratchet mounted to turn with said spool and a programming pawl, and vehicle inertia sensor means for actuating said programming pawl into engagement with said programming ratchet in response to changes in vehicle inertia of more than a predetermined amount, the improvement comprising the provision of:

control means for preventing movement of said programming pawl under the influence of said vehicle inertia sensor means when said belt is fully wound on said spool.

4,492,350

PACKAGING REEL

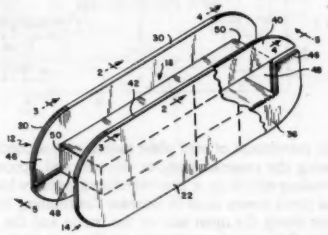
John Dgetluck, Wilbraham, Mass., assignor to Pioneer Packaging, Inc., Chicopee, Mass.

Filed Oct. 17, 1983, Ser. No. 542,545

Int. Cl.³ B65H *75/06, 75/14*

U.S. Cl. 242—118.4 **12 Claims**

1. A reel comprising spaced, parallel first and second outer side wall panels of corresponding configuration and a hub positioned between said first and second side wall panels comprising spaced, parallel first and second longitudinal hub panels spaced inwardly from the edges of said first and second outer side wall panels, said longitudinal hub panels being positioned at right angles to the first and second outer side wall panels and being shorter than said first and second side wall panels such that the ends of said first and second longitudinal hub panels are spaced inwardly equidistantly from the opposite ends of said first and second outer side wall panels, said first and second longitudinal hub panels defining, in conjunction with said first and second outer side wall panels, a channel between the first and second outer side wall panels within which to confine ribbon-like material to be stored thereon and said reel comprising a first reinforcing panel integrally connected at one edge to an edge of the first side wall panel and extending therefrom to one edge of the first longitudinal hub panel, a second reinforcing panel integrally connected at one edge to the other edge of the first outer side wall panel and extending therefrom to one edge of the second longitudinal hub panel, hinge means integrally connecting the other edge of the second reinforcing hub panel to said one edge of the second longitudinal hub panel, a third reinforcing panel integrally connected at one edge to the second outer side wall panel and extending therefrom to the other edge of the second longitudinal hub panel, hinge means integrally connecting the other edge of the third reinforcing hub panel to the other edge of the second longitudinal hub panel, a fourth reinforcing panel integrally connected at one edge to the other edge of the second outer side wall panel and



extending therefrom to the other edge of the first longitudinal hub panel, hinge means integrally connecting the other edge of the fourth reinforcing panel to the other edge of the first longitudinal hub panel and a glue strip hingedly connected to the other edge of the first longitudinal hub panel and adhered to the inner side of the first outer side wall panel intermediate the first and second longitudinal hub panels, said panels being comprised of a single sheet of cardboard appropriately folded to dispose the reinforcing panels at the inner sides of the first and second outer side wall panels and the first and second longitudinal hub panels at right angles to the first and second outer side wall panels and said reinforcing panels being adhesively bonded to the inner sides of the first and second outer side wall panels throughout their area of contact with the inner sides of the first and second outer side wall panels.

4,492,351

HOUSING FOR TAPE CASSETTE

Rainer Zöellner, Dietenhofen, Fed. Rep. of Germany, assignor to Grundig E.M.V., Fuerth, Fed. Reg. of Germany

Filed Jun. 9, 1983, Ser. No. 502,467

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1982, 3221761

Int. Cl.³ G03B *1/04*; G11B *15/32*

U.S. Cl. 242—197 **28 Claims**

1. A housing for receiving an expandable tape cassette comprising at least two sections containing respective winding spools of the tape cassette between which tape runs, with the sections movable with respect to each other so as to vary the distance between the spools and accordingly the running length of the tape therebetween with the housing adapting the cassette for use in tape playing and/or recording devices having different cassette size requirements, said housing comprising:

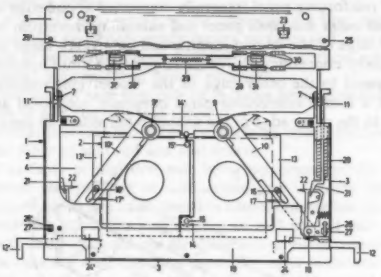
a substantially rectangular frame having at least one open side providing access to the frame interior;

plate means movably supported by said frame and adapted to receive the tape cassette sections with movement of said plate means causing respective movement of the sections positioned thereon;

pivot means supported by said frame and engageable with a portion of tape running between the spools so as to in-

crease the length of the tape adjacent the open side from a first length to a second length and guiding the tape at said second length during the running of the tape between the spools of the cassette;

slide means coupled with said plate means and said pivot means and movable from a first position to a second position whereupon said movement of said slide means causes



the movement of said plate means and accordingly separating the cassette sections thereon and accordingly the winding spools to a predetermined point while pivoting the pivot means so as to increase the running length of the tape along the open side of the frame and the movement from the second position to the first position returns the plate means and pivot means to their initial position.

4,492,352

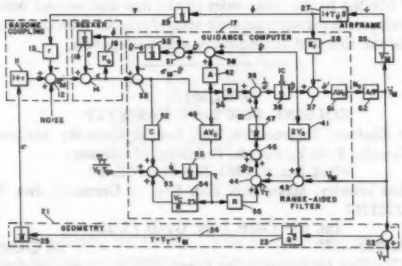
NOISE-ADAPTIVE, PREDICTIVE PROPORTIONAL NAVIGATION (NAPPN) GUIDANCE SCHEME

William R. Yueh, Claremont, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Sep. 22, 1982, Ser. No. 421,537

Int. Cl.³ F41G 7/22

U.S. Cl. 244—3.15 **6 Claims**



1. A method for terminal guidance of a missile to intercept a target, the missile having missile control surfaces to control missile flight direction, said method employing a predictive proportional navigation system including an autopilot, an antenna, an inertial reference unit and a noise adaptive guidance computer, said system including noise and radome error compensation, said computer having an adaptive guidance filtering system, said proportional navigation system having input values for line of sight (LOS) angle σ, antenna electrical boresight angle ϵ, angle θ between the antenna axis and the missile axis, the rate of change $\dot{\theta}$ of the angle θ, and time varying noise-adaptive time constants τ_d and τ_c, where $\epsilon=\sigma_M-\theta$, deriving a modified value of LOS angle σ_M, an estimate of LOS angle σ and a residual LOS angle $\sigma_M-\sigma$, the output of said filtering system being a smoothed line of sight rate $\dot{\sigma}$ which is then multiplied by a product of the system navigation ratio A and the closing velocity V_c to provide command acceleration information to said autopilot to modify the position of the missile control surfaces, actual missile lateral acceleration being detected by said inertial reference unit, the output of said inertial reference unit being a measure of actual lateral acceleration Y_M, said method comprising the steps of:

applying the boresight error angle ϵ to a first combining point;

multiplying the residual LOS angle from said first combining point by a gain A to provide the value $A(\sigma_M-\sigma)$;

combining the value $A(\sigma_M-\sigma)$ with the LOS rate $\dot{\sigma}$ at a second combining point to provide an estimated LOS rate $\dot{\sigma}$;

combining said estimated LOS rate $\dot{\sigma}$ with said rate $\dot{\theta}$ to provide the value $\dot{\sigma}-\dot{\theta}$;

integrating the value $\dot{\sigma}-\dot{\theta}$ to provide $\sigma-\theta$;

feeding back the value $\sigma-\theta$ to said first combining point;

combining said value $\sigma-\theta$ with the angle ϵ to provide the value $\sigma_M-\sigma$ at the input to said filtering system;

multiplying the residual LOS angle by a gain B to provide the value $B(\sigma_M-\sigma)$;

multiplying the LOS rate $\dot{\sigma}$ by $2V_c$;

combining said multiplied LOS rate with acceleration term Y_M at a third combining point to provide the term $2V_c\dot{\sigma}-Y_M$;

multiplying the residual LOS angle by AV_c to provide the value $AV_c(\sigma_M-\sigma)$;

combining the values $AV_c(\sigma_M-\sigma)$ and $2V_c\dot{\sigma}-Y_M$ at a fourth combining point to provide the value

$$2V_c\dot{\sigma}-Y_M+AV_c(\sigma_M-\sigma);$$

dividing the value $2V_c\dot{\sigma}-Y_M+AV_c(\sigma_M-\sigma)$ by the range R between said missile and the target to provide the value

$$\frac{2\dot{\sigma}}{T_{go}}-\frac{Y_M}{V_cT_{go}}+\frac{A}{T_{go}}(\sigma_M-\sigma);$$

combining the immediately preceding value with the value $B(\sigma_M-\sigma)$ to provide the corrective and predictive term

$$\dot{\sigma}=\frac{2\dot{\sigma}}{T_{go}}-\frac{Y_M}{V_cT_{go}}+\left(B+\frac{A}{T_{go}}\right)(\sigma_M-\sigma);$$

then integrating the term $\dot{\sigma}$ to provide the smoothed LOS rate σ; where

$$A=\frac{1}{\tau_d}+\frac{1}{\tau_c}$$

and

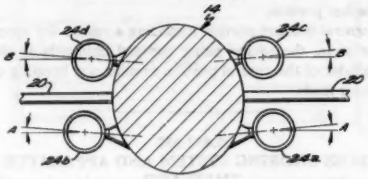
$$B=\frac{1}{\tau_d\tau_c};$$

whereby gains A and B are noise-adaptive and dependent upon time-to-go, while the guidance filter output σ is also range dependent and includes both corrective and predictive terms, said method being a second order guidance scheme.

4,492,353
AIRCRAFT CAPABLE OF VERTICAL SHORT TAKEOFF AND LANDING

Bryan D. Phillips, 11605 49th Avenue North, Plymouth, Minn. 55442

Filed Sep. 30, 1982, Ser. No. 430,432
Int. Cl.³ B64C 15/12, 29/00
U.S. Cl. 244—12.4 7 Claims

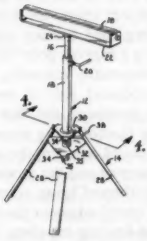


6. Engine mounting and rotating system for use in an aircraft capable of vertical and/or horizontal flight including a fuselage comprising, in combination: a mount formed in the fuselage; a shaft having a first end and a second end, with the first end of the shaft being operatively attached to the engine; bearing means located between the shaft and the mount for allowing the rotation of the shaft but preventing the shaft from moving in any other direction; and means for rotating the shaft in the mount such that the thrust of the engine can be directed at the desired angle by rotating the shaft within the mount, with the bearing means comprising, in combination: first frusto-conical surface formed on the shaft; second, frusto-conical surface formed in the mount complementary to the first frusto-conical surface; first tapered roller bearing members rotatably received by and between the first and second frusto-conical surfaces; a collar removably attached to the shaft, with the collar including a third frusto-conical surface; fourth frusto-conical surface formed on the mount complementary to the third frusto-conical surface; and second tapered roller bearing members rotatably received by and between the third and fourth frusto-conical surfaces.

4,492,354
COLLAPSIBLE STAND FOR ROLLER SUPPORT

Verle L. Rice, Cass County, Mo., assignor to R. B. Industries, Inc., Pleasant Hill, Mo.

Filed Jan. 20, 1983, Ser. No. 459,479
Int. Cl.³ F16M 11/32
U.S. Cl. 248—163.1 3 Claims



1. A collapsible stand for mounting an upright vertical support, said stand comprising:

at least three legs;

a first plate having an opening for receiving said vertical support,

said plate having a plurality of downturned tabs at least equal to the number of legs and adapted to be coupled with said legs;

a second plate adapted to be positioned in spaced apart relationship to said first plate and having an opening aligned with said opening in said first plate,

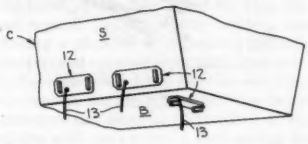
said second plate having a plurality of douwnturned tabs at least equal to the number of legs and adapted to be coupled with said legs; and

fastener means for coupling said plates with said legs.

4,492,355
MAGNETIC MOUNT FOR HEATING MODULE

Robert O. Bylin, Belmont, Calif., assignor to Bylin Heating Systems, Inc., Redwood City, Calif.

Filed Mar. 21, 1982, Ser. No. 390,316
Int. Cl.³ F24H 9/06
U.S. Cl. 248—206.5 5 Claims



1. Apparatus for mounting a heating module having a generally planar face to a ferrous surface so that the face is in heat transferring contact with the surface comprising first and second base members rigid with the heating module and disposed adjacent the periphery of said heating module at spaced apart regions thereof, each said base member having a plate portion extending laterally outward from the periphery of said heating module disposed rearward of the plane of said face in substantial parallelism thereto, each said plate portion having at least one hole therethrough, first and second attachment members mounted to respective said base members, each said attachment member including a rigid elongate spacer extending through said hole, said spacer having an inner first end on one side of said plate portion and an outer second end on the other side of said plate portion, each said attachment member including a magnet having a body and a magnet surface, means for fixing said magnet to said first end of a respective spacer, a handle fixed to said second end and defining an abutment transverse of said spacer, said magnet residing between said plate portion and the plane of said face, a compression spring circumscribing said spacer and extending between said abutment and said plate portion for resiliently biasing said magnet so that said magnet surfae normaly resides in a first position substantially coextensive with the plane of said face, each said spring affording independent movement of a respective said magnet relatve to said face to a second position at which said magnet surface is forward of the plane of said face, said handle affording application of manual force to said magnet to move said magnet to said second position.

4,492,356
PRECISION PARALLEL TRANSLATION SYSTEM

Motoya Taniguchi; Minoru Ikeda, and Yoshihiro Komeyama, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 26, 1982, Ser. No. 436,721
Claims priority, application Japan, Feb. 26, 1982, 57-28963
Int. Cl.³ A47B 91/00
U.S. Cl. 248—346 11 Claims

1. A precision parallel translation system comprising:

a base;

a pair of guide members parallel to each other spaced apart a predetermined distance on said base;

first rough drive means including a first moving member for

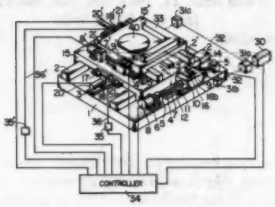
rough movement arranged on said base in parallel relation to said pair of guide members;

a first table slidably supported on said pair of guide members;

first connecting means supported on said first table for connecting and disconnecting said first moving member of said first rough drive means to said first table;

first fine drive means for fine movement supported on a support member arranged for slidingly moving and fixedly secured relation to said base, said first fine drive means including a movable portion connected to said first table;

a pair of guide members parallel to each other spaced apart a predetermined distance on said first table;



second rough drive means including a second moving member for rough movement arranged on said first table and arranged parallel to said pair of guide members;

a second table slidably supported on said pair of guide members;

second connecting means supported on said second table for connecting and disconnecting said second moving member of said second rough drive means to said second table; and

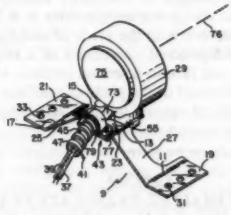
second fine drive means for fine movement supported on a support member arranged for slidingly moving and fixedly secured relation to said first table, said second fine drive means including a movable portion connected to said second table.

4,492,357

FLEXIBLE CONDUIT CONNECTION FOR MOTOR

Giles W. Morrill, Erwin, Tenn., assignor to Morrill Motors of Virginia, Inc., Pemington Gap, Va.

Filed Dec. 10, 1982, Ser. No. 448,796
Int. Cl.³ F16M *5/00*
U.S. Cl. 248—674 **7 Claims**



1. A mounting bracket for an electric motor which provides both support for the motor and a secure anchor for one end of a flexible metal conduit through which electrical leads for the motor pass, the bracket being formed from an elongated relatively flat section of sheet metal by making four distinct bends in the sheet metal through acute angles along four generally straight lines each extending generally perpendicular to the direction of sheet metal elongation so as to define a central bracket portion to which a motor may be attached, a pair of depending legs extending from opposite sides of the central portion and a pair of feet each at a leg end remote from the central portion with the feet adapted to be mounted on a support surface, and means for securely clamping a flexible metal conduit to the central portion to prevent flexing of leads extending from an end of the conduit near the clamping means to a motor attached to the central portion,

the clamping means comprising a U-shaped strap and means for fastening the opposed free ends thereof to the central bracket portion,

the central bracket portion including a region for receiving the strap, the region being inclined obliquely to the remainder of the central portion to minimize bending of the motor leads.

4,492,358

TRUSS SHORING SYSTEM AND APPARATUS THEREFOR

Henry J. Manderla, Burlington, Canada, assignor to Anthes Equipment Limited, Mississauga, Canada

Filed Jul. 23, 1981, Ser. No. 286,277
Int. Cl.³ E04G *11/40*
U.S. Cl. 249—18 **3 Claims**

1. A flying truss utilized in the pouring of concrete floors, said flying truss being for use with jacks for raising and lowering said flying truss and with form means into which the concrete may be poured said flying truss including:

(a) a pair of spaced and braced substantially rectangular interconnectable modular truss sections connected together to form a structural unit, each said section at least including:

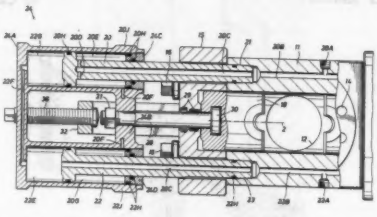
(i) a pair of upper and lower longitudinally extending chords, the upper chords being adapted to support the form means;

(ii) at least a pair of longitudinally spaced vertically extending connectors serving to connect and space said chords apart,

(iii) at least one vertically extending load-bearing member of substantially hollow, box-like cross-section, intermediate said pair of vertical connectors, secured to the side faces of said chords and also serving to connect and space said chords apart, the connection of said vertically extending load bearing member and said lower chord defining a support point for one of said jacks; and

(iv) a pair of diagonally extending members located between an associated pair of vertical connectors and load-bearing members; the first diagonal member of each said pair thereof being connected at its upper end to the upper chord adjacent the upper end of an associated said connector and the second diagonal member of each said pair thereof being connected at its upper end to said upper chord adjacent the upper end of an associated said load-bearing member; the diagonal members of each said pair thereof extending downwardly from their said upper connections towards one another where their lower ends are connected to said lower chord intermediate said associated pair of vertical connectors and load-bearing members, said lower connections being capable of serving, when required, as additional support points for said jacks.

4,492,359
VALVE ASSEMBLY
Benton F. Baugh, 14626 Oak Bend, Houston, Tex. 77079
Filed Jun. 25, 1982, Ser. No. 392,277
Int. Cl.³ E21B 33/06
U.S. Cl. 251—1 A 13 Claims



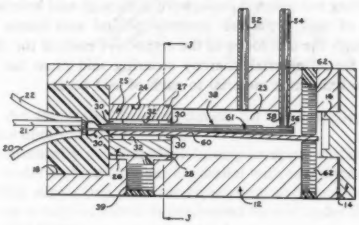
4. In a valve of the ram-type having a housing with a central bore therethrough, a ram guideway transverse to said bore, and a ram slidable along said guideway, improved means for moving said ram comprising:

piston support means interconnected to said housing;

pressure-responsive cylinder means carried by and slidably movable relative to said support means and including an inner cylinder assembly plate rigidly interconnected to said ram whereby said pressure-responsive means is immovable with respect to said ram, said pressure-responsive means being for

urging said ram toward said bore to reduce fluid flow therethrough; and away from said bore and at least partially out of said guideway in response to said pressure.

4,492,360
PIEZOELECTRIC VALVE
Leighton Lee, II, Guilford; Gerald W. O'Dell, Old Lyme, and Ludwig K. Holtermann, Old Saybrook, all of Conn., assignors to The Lee Company, Westbrook, Conn.
Filed Jun. 7, 1982, Ser. No. 385,885
Int. Cl.³ F16K 31/04
U.S. Cl. 251—129 13 Claims

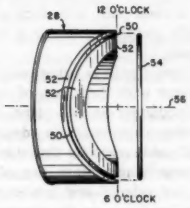


1. In a piezoelectric valve having an elongated, cantilevered control arm assembly with an elongated, cantilevered, piezoelectric valve operating arm adapted to be selectively piezoelectrically deflected in at least one direction in a plane of operation thereof for selectively operating the valve, and mounting means cantilever mounting the control arm assembly, the improvement wherein the control arm assembly further comprises an elongated, cantilevered, limit arm having inner and outer ends and being mounted contiguous to the valve operating arm in its said plane of operation with said outer end separate from said operating arm and adapted to engage said operating arm to limit the deflection of the valve operating arm in its said one direction.

4,492,361
FLAP FOR AIR FLOW CONTROL IN VEHICLE HEATING AND COOLING SYSTEMS
Maurice Jacquet, and Jean-Claude Le Du, both of Maurepas, France, assignors to Valeo, Paris, France
Filed Jul. 19, 1982, Ser. No. 399,285
Claims priority, application France, Jul. 28, 1981, 81 14631
Int. Cl.³ F16K 1/22
U.S. Cl. 251—356 5 Claims

1. A flap for controlling the flow of air in a duct, and particularly in a heater or air conditioner for a motor vehicle, said flap having a peripheral edge being formed by two substantially identical, half-flaps stamped from a sheet of light material having a thickness of less than about 0.6 mm, the half-flaps being joined together in face-to-face relation, each of said half-flaps having a plurality of outwardly projecting hollow stiffener ribs disposed opposite from each other and having rib interiors facing each other when the two are joined forming box section channels, the ribs in each half-flap including longitudinal, transverse, and diagonal rib portions all being in contiguous relation with each other, a duct sealing ring of resiliently deformable material, molded over the peripheral edge of the flap, and an end piece fixed between the mating half-flaps on at least one end of the flap when joined and serving as a stub-axle about which the flap may pivot.

4,492,362
VALVE SEAT WITH TRAPPED O-RING
Frank Garcia, Jr., Spring, and David L. Brown, Houston, both of Tex., assignors to Vetco Offshore, Inc., Ventura, Calif.
Filed Nov. 26, 1982, Ser. No. 444,565
Int. Cl.³ F16K 3/00
U.S. Cl. 251—363 16 Claims



1. A generally cylindrical valve seat adapted to mate transversely with the inner surface of a valve main bore, said seat comprising:

a cylindrical neck portion of constant inner and outer diameters;

a generally saddle-shaped mating end including a smooth eccentric surface between the inner and outer diameters, said eccentric surface contoured to conform to the inner surface of the valve main bore;

a generally rectangular groove following the contour of the eccentric surface and having constant width and depth, said groove further having opposite, parallel sidewalls substantially perpendicular to the eccentric surface, and a base parallel to the eccentric surface;

a flexible O-ring seal trapped within the groove by friction, said ring protruding above the eccentric surface while being compressed within the groove such that the ring contacts the opposite sidewalls and the base.

4,492,363

MULTIPLE PULLEY SHEAVE ASSEMBLY WITH RETAINER PULLEYS

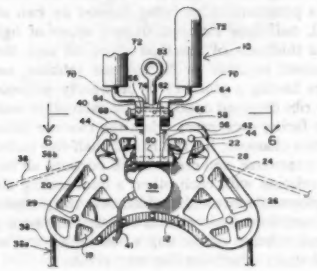
Shale J. Niskin, 3415 Chase Ave., Miami Beach, Fla. 33140

Continuation-in-part of Ser. No. 313,758, Oct. 22, 1981, Pat. No. 4,417,718, which is a continuation-in-part of Ser. No. 222,970, Jan. 7, 1981, Pat. No. 4,301,995, which is a continuation of Ser. No. 105,666, Dec. 20, 1979, abandoned, which is a continuation of Ser. No. 027,311, Apr. 5, 1979, abandoned. This application Feb. 18, 1983, Ser. No. 467,932

The portion of the term of this patent subsequent to Nov. 29, 1998, has been disclaimed.

Int. Cl.[3] B66D *3/08*; G01P *3/50*

U.S. Cl. 254—394 5 Claims



1. A sheave assembly for supporting a cable, comprising:

a support frame;

a plurality of cable-receiving pulleys for receiving the cable comprising at least two outer pulleys and a center pulley positioned therebetween, each of said cable-receiving pulleys being rotatably mounted to said support frame along an arcuate path with their axes of rotation being substantially perpendicular to a plane containing said arcuate path;

a pair of retaining pulleys being rotatably mounted to said support frame with their axes of rotation being substantially perpendicular to said plane, said retaining pulleys being positioned immediately adjacent said cable on the side of said cable opposite that side which is adjacent to said cable-receiving pulleys, one of said retainer pulleys being on one side of said center pulley and the other retainer pulley being on the opposed side of said center pulley;

cable monitoring means operatively coupled to said center pulley for measuring the tension of said cable; whereby the bend of said cable remains substantially constant regardless of the direction of the ends of the cable extending from said sheave assembly, said cable monitoring means includes means for slidably mounting said center pulley to provide movement of said center pulley in a direction substantially angled with respect to said arcuate path at said center pulley and strain measuring means operatively coupled to said means for slidably mounting said center pulley for measuring the force applied by the cable to said center pulley in said direction substantially angled with respect to said arcuate line, whereby the force is used to determine the line tension of the cable, wherein said arcuate path of said cable-receiving pulleys has an increasing rate of curvature as the path extends outward and downward from its center.

4,492,364

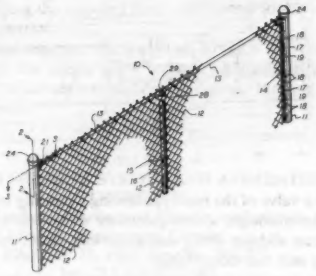
CHAIN LINK FENCE SYSTEM

Walter L. Boyanton, Houston, Tex., assignor to Innovative Research and Development Co., Houston, Tex.

Filed Aug. 17, 1983, Ser. No. 523,838

Int. Cl.[3] B21F *27/00*

U.S. Cl. 256—47 15 Claims



1. A chain link fence system comprising

a pair of end, corner, or gate posts anchored vertically in the earth in laterally spaced relation,

a cross bar extending between the upper ends of said posts and secured thereon, and

a chain link fence material extending between and secured at opposite ends to said posts, in which

each of said posts comprises a tubular metal post having a series of vertically aligned retaining bands spaced longitudinally thereof with narrow openings extending between said bands in vertical linear relation,

said openings receiving the opposite end portions of said chain link fence material,

an opening on the surface of the top portion of said post in vertical alignment with said first named openings and retaining bands to receive one end of said cross bar member,

said cross bar member having opposite end portions, each sized to fit into said last named opening and having a hole positioned vertically when installed in said last named opening, and

a retaining rod inserted downwardly through said hole in the end of said cross bar member behind said bands and through the end loops of the respective ends of the chain link fence material, thereby securing said cross bar and chain link fence material to each of said posts.

4,492,365

POROUS NOZZLE FOR BLOWING GAS THROUGH STEEL

René Dessar, rue Michel Body, 67, B-4330 Grace-Hologne, Belgium

Filed Jun. 27, 1983, Ser. No. 508,165

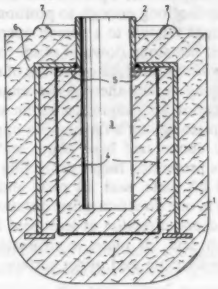
Claims priority, application Belgium, Jun. 25, 1982, 208450

Int. Cl.[3] C21C *5/32*

U.S. Cl. 266—220 4 Claims

1. Porous nozzle for blowing gas through a bath of steel, characterized by a body (1) of solid porous material, having on its upper face a bushing (2) for securing the body to the end of a blowing lance, said body being formed with a central cylindrical cavity (3) which is in communication with the interior of the bushing (2) for receiving an inert gas from said lance, a

large-mesh grill (4) which is embedded in the body and encloses the central cavity (3) so as to reinforce the porous material of the body (1), and a metal ring (5) secured about the bushing (2), the grill (4) being welded to said metal ring (5).



4,492,366

ELASTICALLY DAMPING DEVICE FOR THE SUSPENSION OF AN ENGINE

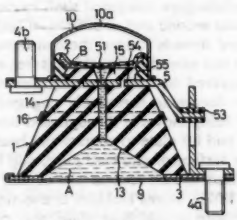
Isao Ozawa; Yukio Aono, both of Inazawa, and Masato Ueno, Komaki, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Sep. 29, 1982, Ser. No. 427,533

Claims priority, application Japan, Sep. 30, 1981, 56-156031; Oct. 9, 1981, 56-161878; Dec. 24, 1981, 56-213604; Dec. 25, 1981, 56-198200[U]; Dec. 29, 1981, 56-215872; Dec. 29, 1981, 56-198337[U]

Int. Cl.³ F16M *5/00*; B60G *11/62*

U.S. Cl. 267—140.1 **10 Claims**



1. An elastically damping device for the suspension of an engine comprising:

an elastically yielding block having an upper surface and an under surface which is in parallel with said upper surface;

a first supporting plate for supporting said block on a body of a vehicle, which is connected to said under surface of said block;

a second supporting plate for mounting said engine on said block, which is connected to said upper surface of said block;

said block being provided with a conical cavity which is formed in the bottom portion thereof so as to open in said under surface, and a passageway which is formed from the top portion of said cavity to said upper surface of said block in the vertical direction;

the diameter of said passageway being changeable as said block yields upon receiving engine vibration of large amplitude;

a bottom plate which is fixed to said under surface of said block and covers said cavity to form a first fluid chamber;

an elastically yieldable sheet member of which peripheral end is fixed to said upper surface of said block around the opening of said passageway to form a second fluid chamber;

said first fluid chamber, said second fluid chamber and said passageway being filled with a liquid.

4,492,367

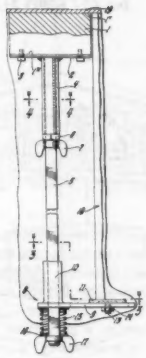
MAGNETIC HOLDING APPARATUS

Larry Cox, 40643 Judd Rd., Belleville, Mich. 48111

Filed Dec. 7, 1979, Ser. No. 101,092

Int. Cl.³ B25B *11/00*

U.S. Cl. 269—8 **3 Claims**



1. An apparatus for holding a furnace or kiln block in a predetermined position relative to the external metallic shell of a furnace or kiln, comprising:

a foot assembly engaging a first side of said furnace or kiln block, said first side being remote from said external metallic shell;

a rod having first and second ends for adjustably supporting said foot assembly so as to hold said furnace or kiln block in a predetermined position relative to said external metallic shell, said rod being threaded along substantially the entire length thereof;

said foot assembly including a plate member adjustably supported by said rod, said plate member being provided adjacent a first end thereof with a collar member adapted to be received about said rod;

a resilient protective pad member mounted on said plate member and adapted to engage said first side of said furnace or kiln block, said protective pad member being adjustably supported on said plate member so as to be selectively fixed at a desired position along the length of said plate member;

said foot assembly including a spring member received around said rod below said plate member, and a fastening member disposed below said spring member;

said fastening member cooperating with the threads of said threaded rod and with said spring member so as to selectively and resiliently fix said plate member at a position along said threaded rod wherein said furnace or kiln block is securely positioned between said protective pad member engaging said first side of said block and a portion of an inner surface of said metallic shell engaging said second side of said block; and

a magnet operably connected to said rod for magnetically securing said apparatus to said external metallic shell to enable said apparatus to hold said furnace or kiln block in said predetermined position to said external metallic shell, said magnet being disposed between said external metallic shell and said rod and having a first side thereof removably and magnetically affixed to said external metallic shell;

said rod having a first end thereof supported by a second side of said magnet opposite said first side of said magnet;

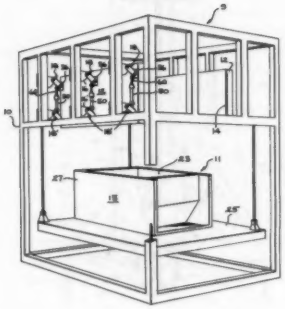
said first end of said rod being adjustably received within a sleeve member secured to said second side of said magnet and secured at a desired position within said sleeve member by a fastening member.

4,492,368

FORCE APPLYING APPARATUS

Cornelius DeLeeuw, and Thomas O. Blunt, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jul. 13, 1983, Ser. No. 513,441
Int. Cl.³ B29D *23/00*
U.S. Cl. 269—32 **11 Claims**



1. Apparatus for applying force in one direction to an article and restraining movement of the article in the opposite direction comprising:

a reciprocally rotatable link having a first and second end,

means to rotate the link connected to the first end of the link,

a cam shaft having a first and second cylindrical portion, said first cylindrical portion having a different central axis of rotation than the second cylindrical portion, said first cylindrical portion of the cam shaft being secured to the end of the link at the end of the link opposite the end connected to the rotating means to provide rotational movement of the cam shaft when the link is rotated,

a mounting block having a bore therethrough and the first cylindrical portion of the cam shaft passes through the bore,

a rotating member pivotal at one end and movable from a first position to a second position and having the second cylindrical portion of the cam shaft rotatably secured at the end opposite from the pivotal end,

whereby rotation of the member from the first position to the second position moves the mounting block in the direction of the article, and rotation of the link rotates the cam shaft about the axis of the second cylindrical portion and the eccentric rotation of the first cylindrical portion through the mounting block causes the mounting block to exert mechanical force against the article in the direction of the article.

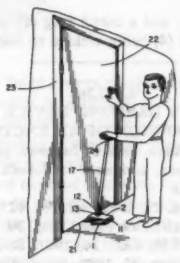
4,492,369

DOOR LIFTING AND CENTERING DEVICE FOR HANGING HEAVY DOORS

Harold F. Pohl, 69 Dawn Ave., Piano, Ill. 60545

Filed Feb. 7, 1983, Ser. No. 464,308
Int. Cl.³ B23Q *3/18*
U.S. Cl. 269—60 **4 Claims**

1. A door lifting and centering device for hanging heavy doors, comprising door engaging means to raise and lower a door to position it for hanging, lifting means to raise and lower said door engaging means, said lifting means including elongated operating means to operate said lifting means for raising and lowering said door engaging means, said elongated operating means including a hand grasp member, said elongated operating means extending between said door engaging means and said hand grasp member a preselected distance, said preselected distance being long enough to position said hand grasp member at a height relative to a person operating said device whereby he need not stoop down in order to reach said hand grasp member with his hand for operation of said device when said door engaging means thereof has engaged a door for positioning said door for hanging, wherein said lifting means includes a base plate having a flat smooth upper surface, a lift plate positioned above said base plate, said door engaging means includes a projecting finger projecting outwardly from an edge of said lift plate, said lift plate and said projecting finger extending in one direction a first distance, said base plate extending in said one direction at least said first distance, an aperture through said lift plate, a projecting body portion extending upwardly from said upper surface of said lift plate



positioned over said aperture and integrally connected to said lift plate, said projecting body portion including an internally threaded bore therethrough, said internally threaded bore being in registration with said aperture, said elongated operating means including an elongated shaft having a first free end and an opposite second end, a portion of said elongated shaft having external threads formed thereon from an intermediate point thereon and extending to said first free end, said first free end being received in said internally threaded bore of said body portion becoming threadedly engaged therewith, said first free end being movable through said bore and said aperture through said lift plate to contact and bear against said flat smooth upper surface of said base plate, said hand grasp member being affixed to said second end of said elongated shaft, wherein said lifting means includes connecting means to connect said lift plate to said base plate, said connecting means including a hinge assembly to connect a first end of said lift plate to a corresponding first end of said base plate.

4,492,370

QUICK RELEASE CLAMPING DEVICE

Kyoo P. Park, 4657-208A St., Langley, British Columbia, Canada

Filed Nov. 10, 1982, Ser. No. 440,503
Int. Cl.³ B25B *1/02*
U.S. Cl. 269—182 **5 Claims**

1. A clamping device comprising:

a first jaw member;

a second jaw member;

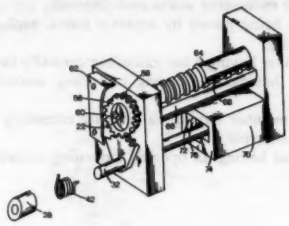
a screw having a screw spindle rotatably mounted on the first jaw member;

a half nut mounted on the second jaw member;

a cam means operatively connecting the screw to the half nut so that the half nut is engaged with the screw or disengaged from the screw by rotation of the screw, the cam means comprising a cam and a cam follower, the half nut being mounted on the cam follower;

gear means connecting the screw to the cam means, the gear

means comprising a gear wheel connected to the screw and a gear wheel segment connected to a cam lobe;



a cam spindle connected to the cam, the gear wheel segment being rotatably mounted on the cam spindle; and resilient means connecting the gear wheel segment to the cam spindle.

4,492,371

FEEDING DEVICE

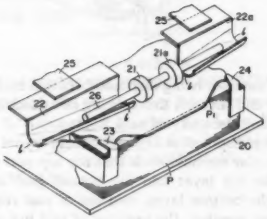
Yasuhito Kan, Urawa, and Koichi Miyamoto, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 234,601

Claims priority, application Japan, Feb. 22, 1980, 55-21345; Oct. 2, 1980, 55-138003; Oct. 2, 1980, 55-138001

Int. Cl.³ B65H *3/32*

U.S. Cl. 271—21 **17 Claims**



1. A feeding device, comprising:

a stacking table for carrying thereon a stack of cut sheets;

separation pawls, disposed on the downstream side of said stacking table with respect to a feeding direction of the cut sheets to engage both downstream corners of said stack of cut sheets, for separating the topmost sheet of the stack;

first mounting means;

feeding means, mounted with said first mounting means to be disposed upstream of said separation pawls with respect to the feeding direction of the cut sheets, for urging the topmost sheet in the feeding direction to cooperate with said separation pawls to warp the topmost sheet and separate it from the remaining sheets of the stack, and then feed it out;

second mounting means separate from said first mounting means; and

warp regulating means, mounted with said second mounting means to provide a clearance between itself and the topmost sheet when the topmost sheet is not fed, for regulating the formation of the warp, at least a portion of said warp regulating means being disposed between said feeding means and said separation pawls in a direction generally perpendicular to the feeding direction and downstream, in the feeding direction, of a portion of contact between the feeding means and the cut sheets and between the portion of contact and said separation pawls.

4,492,372

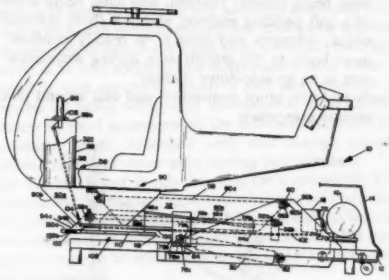
AMUSEMENT HELICOPTER

Allan L. Lorence, Oelwein; Thomas L. Maring, Cedar Rapids, both of Iowa, and James L. Rawson, deceased, late of Oelwein, Iowa (by Oelwein State Bank, administrator), assignors to Rawson Control Systems, Inc., Oelwein, Iowa

Filed Feb. 11, 1982, Ser. No. 348,032

Int. Cl.³ A63G *31/00*

U.S. Cl. 272—1 C **8 Claims**



1. An amusement aircraft simulator comprising:

a. frame support means including a raisable fourbar linkage having one end rotatably mounted about a shaft secured on said frome and an aircraft body supported on an other end of said linkage;

b. hydraulic means including a motor-driven hydraulic pump, a reservoir, a geometrically configured valve means connected thereto connected in a hydraulic circuit, and a hydraulic cylinder connected between said frame and a midpoint of said fourbar linkage;

c. electronic control means for controlling said hydraulic means and supported on said frame;

d. stop pin means for limiting the distance of travel of said fourbar linkage; and connected to said valve means;

e. safety bar means over a portion of said fourbar linkage, said safety bar means including pivoting structure connected at a rearward end to said fourbar linkage and having slotted key means at an other end, a first barbell crank connected to a forward end of said fourbar linkage and said slotted key means, and a joy stick linkage connected on opposing sides of said first barbell crank, and a second barbell crank connected to a rearward end of said fourbar linkage;

f. joy stick means positioned at said other end if said fourbar linkage and including linkage means connected to said valve means; and,

g. said aricraft body mounted to said other end of said fourbar linkage housing said joy stick means therein, whereby manual actuation of said joy stick means actuates said hydraulic means to further actuate said fourbar linkage to move said aircraft body to simulate free flight.

4,492,373

BODY THERAPEUTIC AND EXERCISING APPARATUS

Max Dzitzer, 1953 Rayshire St., Thousand Oaks, Calif. 91360

Continuation-in-part of Ser. No. 223,686, Jan. 9, 1981, abandoned. This application Nov. 1, 1982, Ser. No. 437,964

Int. Cl.³ A61H *1/02*

U.S. Cl. 272—61 **4 Claims**

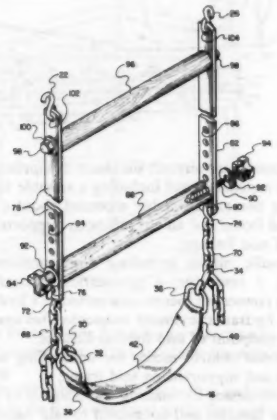
1. A therapeutic exercising device comprising:

a first hanger and a second hanger, both said first hanger and said second hanger having an upper end and a lower end, each said upper end including a hanging means, said hanging means facilitating connection of both said first and second hangers to fixed structures so said first and second hangers suspend therefrom, said first hanger including a first rigid member, said second hanger including a second rigid member;

a first chain connected to and extending from said first rigid member of said first hanger at said lower end, a second chain connected to and extending from said second rigid member of said second hanger at said lower end;

a sling having a fore end and an aft end, said fore end terminating in a first pivot connection, said aft end terminating in a second pivot connection, said first pivot connection being connected to said first chain with said second pivot connection being connected to said second chain, said sling being flexibly resilient, said sling being constructed of a soft padding encased within a sheet material fabric cover, whereby said sling is to readily conform to the users body in the midriff area during suspension of the user in an up-side-down manner;

both said first pivot connection and said second pivot connection comprises:



a first ring and a second ring, both said first and second rings being connected by sewing to said sheet material fabric cover, a first hook removably connected to said first chain, said first hook being connected to said first ring, a second hook removably connected to said second chain, said second hook being connected to said second ring, said first and second hooks can be disengaged from their respective said chain and relocated to a different location on its respective said chain thereby providing adjustment;

both said first rigid member and said second rigid member including a series of openings; and

at least one rigid bar member connecting said first rigid member and said second rigid member, said rigid bar member being spaced from said sling, said bar member being removably connected to said series of openings of first and second rigid members by a manually operable knob assembly.

4,492,374

SPORTING AND EXERCISING SPRING SHOE

David Lekhtman, 5350 Macdonald, Montreal, Quebec, and Gregory Lekhtman, 6555 Kildare, Cote St. Luc, Quebec, both of Canada

Filed Apr. 21, 1981, Ser. No. 256,100
Int. Cl.³ A63B *25/10*
U.S. Cl. 272—114 **7 Claims**

1. A sporting and exercising unit; comprising:

a foot receiving member;

a spring member attached to and disposed at the bottom of said foot receiving member;

said spring member comprising a spring-leaf-like portion forming a closed loop and shaped to permit backward and forward rocking of a user;

said spring member being shaped to form an oval shape;

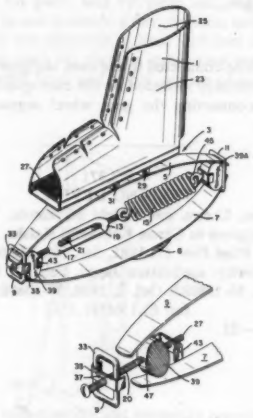
said oval being formed from two separate layers, each said layer comprising a flexible material, said layers being joined to each other at the ends thereof;

said layers being joined by separate joints, each said joint comprising;

a ring member having a bar extending centrally thereacross, said bar having an opening extending centrally therethrough;

a circular member having an opening extending diametrically thereacross;

a second bar having an opening extending centrally therethrough;



said circular member being disposed between said layers at a respective end thereof, the opening of said circular member extending centrally of said layers;

said ring being disposed at one end of said layers outwardly of said circular member such that the top part of the ring overlies the top layer and the bottom part of the ring underlies the bottom layer, said bar of said ring abutting said circular member, the opening of said bar of said ring being aligned with the opening in said circular member;

said second bar abutting said circular member on the other side thereof, the opening of said second bar being aligned with the opening of said circular member; and

a respective rod member extending through said aligned openings of each respective joint.

4,492,375

RESILIENT TYPE EXERCISING DEVICE WITH REMOVABLE WEIGHTS

Richard E. Connelly, Jeromesville, Ohio, assignor to Contractor Equipment Manufacturers, Inc., Ashland, Ohio

Filed Aug. 16, 1982, Ser. No. 408,146
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—134 **8 Claims**

1. Apparatus for physical exercise comprising:

a longitudinal column,

a first sleeve slidably engaging said column, said sleeve including first securing means for securing a biasing means to said sleeve,

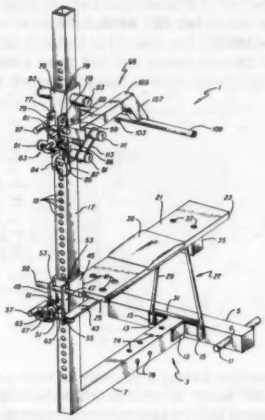
first locking means for locking said first sleeve at a selected position along said column,

a lever transversely, pivotally connected to said first sleeve, said lever comprising: a yoke straddling said first sleeve and containing coaxial transverse yoke bores; an arm joined to said yoke centrally; and second securing means joined to said arm for securing a biasing means to said arm,

pivot means passing through said yoke bores and said first

sleeve for pivotally connecting said first sleeve and said lever,

biasing means securable to said first and second securing means for providing resistance to pivotal movement of said lever,



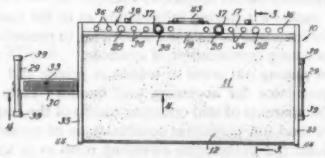
wherein said pivot means comprises a cylinder extending through said yoke bores and said biasing means comprises a helical coil encircling said cylinder, said coil having first and second coil arms for bearing on said first and second securing means, respectively.

4,492,376

LOWER EXTREMITY EXERCISER

Jack M. Schatz, 403 W. Harding Rd., Lombard, Ill. 60148, and Robert S. Gajda, 5921 Meadow La., Lisle, Ill. 60532

Filed Apr. 1, 1983, Ser. No. 481,407
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—138 **11 Claims**



1. In a lower extremity exercise board device of the type for use with endless elastic bands including a planar bed member closely associating with a plurality of vertical sockets for receiving band engageable peg members, the improvement comprising:

support means associating with the undersurface of the bed member forming an open-ended channel and at least one storage chamber to a side of the channel, said support means including;

an elongate support member rigidly connected to the bed member to be supportively arranged at the undersurface of the bed member and extend outwardly of the bed member along one edge thereof and generally parallel to said channel, said support member having an upper horizontal surface including a plurality of spaced-apart vertical sockets having axes at generally right angles to said planar bed and an external vertical edge surface including horizontal spaced-apart apertures having axes at generally right angles to the socket axes, said upper horizontal surface forming a depressed shoulder with respect to the edge of said bed member;

a slidable bar means movably arranged within said channel and terminating at an outward end thereof in band-engageable means, the bar means being movable outward of said channel to position said outward end at a pre-selected distance from said bed member;

latching means associated with said slidable bar means capable of securing the bar means at pre-selected positions from the bed member;

a plurality of band engageable peg members insertably cooperative with said vertical sockets and horizontal apertures wherein peg members are sized to be vertically held upon insertion at said sockets, and horizontally held when inserted at said apertures, wherein said peg members are capable of being selectively insertable to provide for a variety of band arrangements for different exercises; and,

securement means associated with said storage chamber means capable of removably storing peg members;

wherein said improved device provides for a removably looping engagement of endless elastic bands around said peg members and band-engageable means without mechanical fastening of bands, and wherein said peg members and slidable bar means enable the device to be selectively arranged for a wide variety of band orientations.

4,492,377

COLLAPSIBLE BATON

George W. Eby, 29188 S. Grayshill Rd., Colton, Oreg. 97017

Filed Mar. 30, 1984, Ser. No. 595,353
Int. Cl.³ F41B *15/02*
U.S. Cl. 273—84 R **9 Claims**

1. A collapsible baton comprising

a first member including a sleeve portion and an annular radially outwardly projecting shoulder joined to one end of the sleeve portion,

a second member including a stem portion conforming with and extending through said one end of the sleeve portion and snugly fitted within said sleeve portion, said second member further including a mounting portion forming the other end of the second member and an annular radially outwardly projecting shoulder disposed intermediate said stem portion and said mounting portion, said second member having a passage extending therethrough between its ends,

a first tubular baton section with one end enveloping and fixedly engaging the sleeve portion of said first member adjacent the shoulder of said first member,

a second tubular baton section with one end enveloping and

fixedly engaging said other end of said second member adjacent its shoulder, and

biasing means operatively interposed the two members operatively to pull them together.

4,492,378

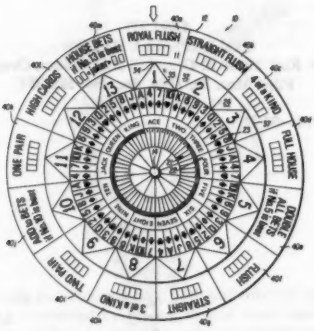
GAME APPARATUS

Daniel W. Williams, Atlantic City, N.J., assignor to Robert McCardy, Atlantic City, N.J.

Division of Ser. No. 184,874, Sep. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 39,555, May 16, 1979, abandoned. This application Feb. 5, 1982, Ser. No. 346,361

Int. Cl.³ A63F 5/04

U.S. Cl. 273—142 HA **5 Claims**



1. Apparatus for playing a game of chance, the apparatus comprising in combination:

a rotatable wheel, the wheel including:

a display surface divided into first, second, third and fourth concentric, annular areas,

wherein

the first area is innermost of the four concentric areas and is divided by fifty-two radial lines into fifty-two sections consecutively numbered by numerals 1 to 52;

the second area surrounds the first area and is divided by thirteen radial lines into thirteen sections marked with indicia identifying each section consecutively with a single respective denomination of the thirteen denominations of a standard fifty-two card playing deck;

the third area being divided by fifty-two radial lines into separate sections each of which is identified by indicia specifying one respective playing card in a standard deck of fifty-two playing cards; and

the fourth area surrounding the third area and being divided by thirteen radial lines into thirteen spaces consecutively identified by numerals one through thirteen;

means for mounting the wheel for rotation about an axis, and means for stopping rotation of the wheel; and

a fixed surface disposed adjacent to the wheel and having a display area visible around the periphery of the wheel, the display area being divided into thirteen spaces, each space having indicia therein indicative of a class of playing card hands or an instruction.

4,492,379

REEL TYPE SLOT MACHINE

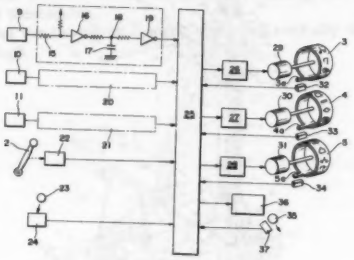
Kazuo Okada, Tokyo, Japan, assignor to Kabushiki Kaisha Universale, Tochigi, Japan

Filed Dec. 20, 1982, Ser. No. 451,240

Claims priority, application Japan, Dec. 22, 1981, 56-191405[U]

Int. Cl.³ A63F 5/04

U.S. Cl. 273—143 R **2 Claims**



1. A slot machine having a pluraltiy of reels provided each with an annular series of various symbols, said reels being rotatably arranged side-by-side, wherein, upon the occurrence of a predetermined prize winning combination of symbols in prize awarding rows of said symbols, coins or tokens are paid out, said slot machine comprising:

a pulse motor individual to each said reel;

means to supply a series of pulses to said motor continuously during the rotation of the reel associated with said motor, for driving said motor;

means for stopping each said reel;

means for detecting the stopped position of each said reel, said detecting means comprising means for counting said pulses as they are supplied to said pulse motor, a light shielding member on each reel, and a photo-interrupter responsive to interruption of light by said light shielding member for resetting the previous content of said counting means to zero once each rotation of the reel;

memory table means for storing information as to the symbol arrangements of the respective reels;

memory means for storing information as to the number of coins or tokens to be paid out according to predetermined prize winning combination of symbols;

means for paying out coins or tokens as prizes; and

a microprocessor for accessing said memory table means with the contents of said counting means of the respective reels to read out particular combinations of symbols that have occurred in the prize awarding rows so as to detect coincidence of said particular combinations of symbols with said predetermined prize winning combinations of symbols and to control said pay-out means to pay out a given number of coins or tokens as prizes.

4,492,380

ARENA TYPE GAME

Andrew Saytar, 184 Glenview Dr., Mississauga, Ontario, Canada L5G 2N6

Filed Mar. 21, 1983, Ser. No. 476,914

Int. Cl.³ A63B 71/02

U.S. Cl. 273—411 **1 Claim**

1. Game apparatus, suitable for use when playing both a modified hockey game and a modified basketball game, where the apparatus comprises:

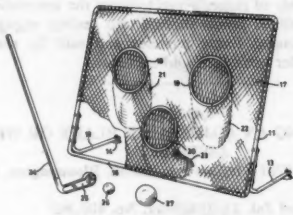
two goal assemblies, where a goal assembly comprises:

a net;

a net-supporting frame;

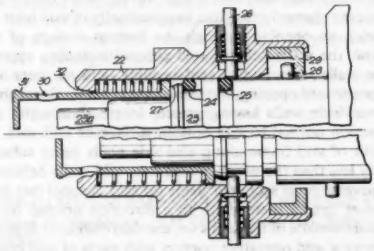
where the net is stretched over the frame and where the net is held by the frame in a substantially upright position;

at least one hole formed in the net;
a rigid ring;
where the ring is secured and attached to the material of the net in such a manner as to delineate the hole;
a pocket, formed of net material;
where the ring is secured and attached to the net material of the pocket in such a manner that the pocket is effectively secured and attached to the net, and is effective to receive and contain a game ball that passes through the ring;
wherein the diameter of said at least one delineating ring is substantially 12 inches;



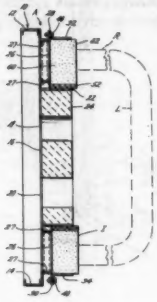
and the apparatus further comprises two balls;
a first ball for use when playing a modified hockey game, the ball being a sphere having a diameter substantially of 3 inches, and having the characteristic of being not bounce-able on the surface of the playing area, substantially in the manner of a hockey puck on ice;
and a second ball for use when playing a modified basketball game, the ball being a sphere havin a diameter substantially of 6 inches, and having the characteristic of being bounce-able on the surface of the playing area, substantially in the manner of a basketball on a basketball court.

4,492,381
SEALING PLUG
Gordon C. Cooper, and Douglas Dawson, both of Derby, England, assignors to Rolls-Royce Limited, London, England
Filed Jul. 17, 1984, Ser. No. 631,748
Claims priority, application United Kingdom, Sep. 21, 1983, 8325268
Int. Cl.³ F16J *9/0, 15/0*
U.S. Cl. 277—2 **5 Claims**



1. A sealing plug comprising a plug member and a housing, the plug and housing including co-operating means whereby they may be secured together, the radially outermost cylindrical surface of the plug including at least one circumferentially extending groove within which an O ring seal may be disposed, the housing including an aperture within which the plug is adapted to be located within the at least one circumferentially extending groove when the O ring is omitted from the assembly such as to prevent the plug being secured within the housing by the co-operating means.

4,492,382
REFRACTORY FIBER LADLE PREHEATER SEALING RINGS
Mack A. Hounsel, Houston, Tex., assignor to J. T. Thorpe Company, Houston, Tex.
Filed Dec. 21, 1983, Ser. No. 564,745
Int. Cl.³ F16J *15/02*; F27B *14/08*
U.S. Cl. 277—12 **23 Claims**

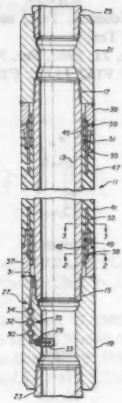


1. An apparatus for sealing the rim of a ladle as it is positioned adjacent a ladle preheater, comprising:
(a) a plurality of refractory fiber ring insulation units, each of said units comprising:
(1) a plurality of adjacent layers of refractory ceramic fiber insulating material;
(2) said layers having an inner surface portion adjacent the preheater;
(3) said layers further having an outer surface portion adapted to be contacted by the rim of the ladle during preheating of the ladle;
(4) said layers further having intermediate portions extending between said inner and outer surface portions;
(b) means conforming to the shape of the rim of the ladle for mounting said plurality of refractory fiber insulation units adjacent the preheater;
(c) said layers being mounted on said means for mounting in planes extending radially outwardly from a central portion of the ladle.

4,492,383
INFLATABLE WELL BORE PACKER WITH PRESSURE EQUALIZED RIB CAVITY
Edward T. Wood, Kingwood, Tex., assignor to Completion Tool Company, Houston, Tex.
Continuation of Ser. No. 470,199, Feb. 28, 1983, abandoned. This application Mar. 9, 1984, Ser. No. 587,918
Int. Cl.³ F16J *15/46*; E21B *33/127*
U.S. Cl. 277—34 **11 Claims**

1. A inflatable packer, which comprises:
a tubular mandrel;
an inflatable sleeve positioned about said mandrel, said inflatable sleeve including a pair of axially spaced apart axially extending annular cavities adjacent the ends of said inflatable sleeve;
an annular head connected to each end of said inflatable sleeve, each head including a reinforcing sheath comprising a plurality of axially extending overlapping ribs connected at one end to one of said heads and extending into the adjacent one of said cavities;
a collar connected to each head, both of said collars being connected to said mandrel, one of said collars including

passage means for allowing inflating fluid to inflate said sleeve;



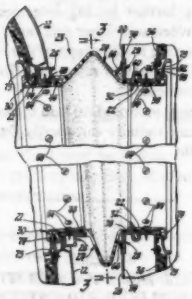
and means for communicating well bore fluid to said cavities, thereby to balance the pressure between said ribs to equal the well bore pressure.

4,492,384

SEALING ARRANGEMENT

Fredric A. Herschelman, Lapeer, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 25, 1983, Ser. No. 488,066
Int. Cl.³ F16J *15/02*; B60P *3/32*
U.S. Cl. 277—237 R **2 Claims**



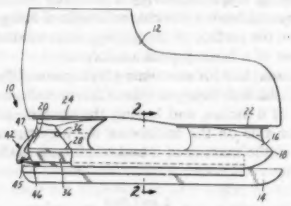
1. A sealing arrangement for sealing a first opening formed in the rear portion of a cab and a second opening aligned with the first opening and formed in the front portion of an enclosure located adjacent to said cab, said first opening and said second opening each being defined by a ring type frame member having a continuous flat mounting surface, a continuous groove formed in the mounting surface of one of said frame members and having a circular cross sectional configuration, said sealing arrangement including a boot and a pair of molding members, said boot having a continuous elastomeric body portion of uniform cross-section and including a V-shaped web section integrally formed with a pair of oppositely extending arm members, each of said arm members terminating with a radially outwardly extending and reversely bent continuous foot, a continuous bead member having a circular head, said bead member being integrally formed on one of said arm members and extending radially outwardly therefrom in the same direction as the associated foot formed on said one of said arm members, said circular head of said bead member adapted to be snapped into and retained by said groove formed in said one of said frame members for maintaining the associated arm member in engagement with the mounting surface of said one of said frame members, a tapered lip integrally formed on one leg of said web section, said lip being curved towards and terminating adjacent to said bead member when in the unflexed position, each of said molding members having a pair of transversely spaced and continuous ridges formed thereon, and fastener means for securing said pair of molding members to the respective frame members of said first and second openings with an arm member of said boot located between each of said pair of molding members and the associated frame member whereby said pair of ridges serve to press the associated arm member at localized points thereof into sealing engagement with said associated frame member and said lip sealingly contacts the outer surface of said enclosure.

4,492,385

SKATE HAVING AN ADJUSTABLE BLADE OR WHEEL ASSEMBLY

Scott B. Olson, 8701 Virginia Ave. South, Bloomington, Minn. 55438

Filed Jul. 21, 1982, Ser. No. 400,302
Int. Cl.³ A63C *17/18*
U.S. Cl. 280—7.13 **6 Claims**



1. A skate comprising a boot including a sole having a bottom surface, an operative portion affording relative movement of the skate with respect to a supporting surface and including means for making contact with said support surface only along a single straight narrow area, and means for releasably fastening said operative portion to said boot, said means including:

a frame having top and bottom surfaces fixed to said sole with the top surface of said frame against the bottom surface of said sole, said frame having walls defining an elongate channel extending longitudinally of said boot and having an opening through the bottom surface of said frame, the walls defining said channel including opposed side walls extending to said opening, and an inner wall opposite said opening, the transverse cross sectional shape of said side walls having greater length than width in a direction normal to said bottom surface of said sole, the width of said frame along said side walls being substantially less than the width of said sole, said walls defining a transverse cross sectional shape for said channel that has a greater length than width in a direction normal to the bottom surface of the said sole, and said channel releasably receiving said operative portion with parts of said operative portion and said side walls being in close fitting relationship including projections on said operative portion, said projections having a greater height than width in a direction normal to the bottom surface of said sole and being received in recesses in said side walls and parts of said operative portion projecting along said side walls to a position closely adjacent said inner wall; and

manually operable means for releasably securing said operative portion in said channel at a predetermined position with respect to said frame with said single straight narrow area centrally aligned with said opening.

4,492,386

TRAILER SAFETY DEVICE

Hardy G. Roberts, 2790 Oneida La., Provo, Utah 84604

Filed Jun. 10, 1983, Ser. No. 503,301
Int. Cl.³ B60D 1/12
U.S. Cl. 280—507 17 Claims

1. A safety device to be used in conjunction with a trailer coupling having a movably operable member capable of being moved substantially vertically to effect the opening or closing of the trailer coupling comprising:

a bracket assembly capable of being secured in position above the movably operable member of the trailer coupling;

means for securing said bracket assembly in position above the movably operable member of the trailer coupling;

a free-swinging body assembly suspended from said bracket assembly and positioned in spaced relationship above the movably operable member of the trailer coupling thereby blocking the movably operable member from substantial upward vertical movement to open the trailer coupling; said body assembly being manually retractable to enable upward vertical movement of the movably operable member opening the trailer coupling; and

limitation means for restricting the arcuate motion of said free-swinging body assembly such that said body assembly is maintained in a position above the movably operable member unless manually displaced.

4,492,387

STEP-IN SIDE-CLAMP SAFETY SKI RELEASE SYSTEM

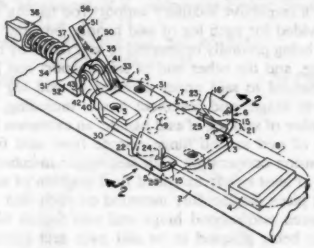
Richard G. Spademan, 1421 Old Country Rd., Belmont, Calif. 94002

Continuation of Ser. No. 109,807, Jan. 7, 1980, abandoned. This application Apr. 20, 1982, Ser. No. 370,028
The portion of the term of this patent subsequent to Oct. 5, 1999, has been disclaimed.
Int. Cl.³ A63C 9/085
U.S. Cl. 280—624 11 Claims

1. In a ski binding having a housing, a clamping member movably mounted in said housing for movement relative to said housing between a clamp-open and a clamp-closed position and means for applying a clamping force to said clamping member for releasably securing a ski boot to a ski rearward of the toe and forward of the rear of the heel of the ski boot, an improvement for opening and closing said clamping member comprising:

a lever member of one-piece construction spaced from and independent of said clamping member having a first and a second end movable about an axis intermediate said ends between a clamp-open and a clamp-closed position, said lever member being coupled to said clamping force applying means;

means on the lever member and engageable by a ski pole for allowing said lever member to be moved to its clamp-open



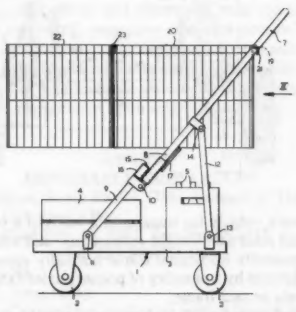
position against said clamping force in response to a force applied to said first end thereof by said ski pole to allow said clamping member to move to its open position; means for frictionally holding said lever member in its open position against said clamping force when the force applied by the ski pole to said first end of said lever member is removed therefrom; and means for moving said lever member to its clamp-closed position in response to applied pressure brought to bear on said second end thereof for releasing said lever member from said holding means when said ski boot is in skiing position to allow said clamping member to close with said clamping force.

4,492,388

COLLAPSIBLE SHOPPING CART

Hendrik C. de Wit, Burg. Hogguerstraat 529, 1064 CV Amsterdam, Netherlands

Filed Dec. 28, 1981, Ser. No. 335,098
Claims priority, application European Pat. Off., Dec. 29, 1980, 80201239.3
Int. Cl.³ B62B 3/02
U.S. Cl. 280—651 8 Claims



1. A shopping cart comprising: a movable frame; a support structure collapsibly mounted on said frame; and at least one basket for purchases, said at least one basket being removably fastened to said support structure; said support structure com-

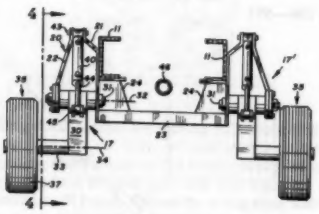
prising a U-shaped handle having a middle portion and two legs which extend downwardly at an angle in the operating state of said cart, the free end of each of said legs being respectively pivotally connected to said frame by means of a first hinge; said middle portion of said U-shaped handle being located at hand level in the operating state of said cart and forming a handgrip for pushing said cart; each leg of said handle respectively comprising an upper and lower member which are pivotally interconnected by means of a second hinge; the members of each leg being provided with abutment means for the at least nearly extended final position of said members, said second hinge, in the operating state of said cart, being located between said frame and the underside of said at least one basket; a respective auxiliary support rod having two ends being provided for each leg of said handle, one end of said support rod being pivotally connected to said frame by means of a third hinge, and the other end of said support rod being pivotally connected to said upper member of said leg by means of a fourth hinge; said abutment means including, on said lower member of said leg of said handle, an extension located on that side of said second hinge remote from said first hinge, said extension cooperating with said upper member of said leg in said at least nearly extended final position of said members; a shift piece displaceably mounted on each said upper member between said second hinge and said fourth hinge, said shift piece being adapted to be slid over said extension to effect fixing of said members of a given leg in said extended final position; a connecting rod which rigidly interconnects said shift pieces of each leg and simultaneously serves as a support for the underside of said at least one basket, a horizontal transverse bar located in the vicinity of said handgrip portion of said handle and extending between said legs of said handle, said at least one basket being fastened to said transverse bar; said at least one basket including a wire-part, and at least one hook that can be flipped over, said at least one hook, after introduction of said at least one basket into said support structure, being placed around said transverse bar of said handle to effect said fastening of said basket to said support structure, said at least one hook having two hook ends.

4,492,389

HIGH-LIFT HYDRAULIC AXLE

Gordon F. Wyatt, Rte. 4, Box 122, Isanti, Minn. 55040; Willis G. Wyatt, 8505 Eldorado St., Blaine, Minn. 55434, and Erle L. Wyatt, 14461 Highway 65, Anoka, Minn. 55303

Filed Jan. 21, 1982, Ser. No. 341,509
Int. Cl.³ B60G *11/26*
U.S. Cl. 280—704 **4 Claims**



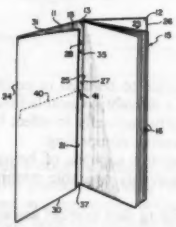
1. A work vehicle for transporting loads of a weight which can exceed road axle weight restrictions, said vehicle having:
(a) a generally horizontal frame normally supported above the ground by a plurality of primary axles extending transversely to said frame;
(b) wheel means rotatably attached to each end of said primary axles;
(c) at least one auxiliary wheel assembly comprising:
(1) a suspension arm;
(2) a stub axle having an axis and projecting from said arm in a first generally horizontal direction;
(3) wheel means rotatable on said stub axle;
(4) a mounting bracket adapted for securement to the outside of said generally horizontal frame;
(5) means pivoting said suspension arm in said bracket, so that said first direction is outward from said frame, for movement of said arm about a second axis aligned with said axis of said axle;
(6) and means for causing said movement of said arm between first and second extreme positions to lower and raise said axle through a path lying totally outward of the frame, so that said axle moves between a first position in which said wheel means contacts the ground to increase the number of axles having wheel means contacting the ground to help support the vehicle and thus reduce the axle weight of said vehicle and a second position in which said axle is spaced from the ground by a distance greater than the spacing of said frame above the ground to prevent said axle from engaging obstructions in the path of the vehicle.

4,492,390

COMBINED AIRLINE TICKET HOLDER AND ADVERTISING BOOKLET

Anthony S. Jacobs, Glencoe; James E. Riley, Deerfield, and Jon D. Christman, Northbrook, all of Ill., assignors to The Wessel Company, Inc., Elk Grove Village, Ill.

Filed Aug. 20, 1981, Ser. No. 294,453
Int. Cl.³ B42D *3/12*
U.S. Cl. 281—31 **22 Claims**

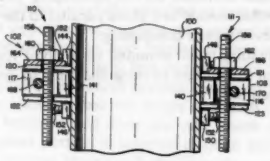


1. An article of manufacture comprising:
a pair of covers joined together along a junction;
a booklet comprising a plurality of pages;
said booklet being located between said covers;
means attaching said booklet to a cover;
and means on said article for holding an object;
said pair of covers, said booklet pages, and said holding means having lateral and longitudinal dimensions;
each booklet page being joined together along an inner longitudinal edge portion and having an unjoined longitudinal edge portion;
the longitudinal dimensions of both covers, of said booklet pages and of said holding means being the same;
the lateral dimension of each cover and of each booklet page being constant along the entire length thereof;
all of said booklet pages having substantially the same lateral dimension;
the lateral dimension of one cover being different than the lateral dimension of said booklet pages along substantially the entire length of each to facilitate thumbing readily of said one cover without obstruction by said booklet;
the lateral dimension of the other cover being different than the lateral dimension of said one cover to facilitate thumbing readily of said other cover without obstruction by said booklet and to facilitate thumbing readily of either of said covers without obstruction by another cover.

4,492,391
THRUST ROD ANCHOR FOR PIPE JOINT RESTRAINT SYSTEMS

Robert E. Haines, Columbus, Ohio, assignor to Star Industries, Inc., Columbus, Ohio

Filed May 3, 1982, Ser. No. 374,000
Int. Cl.³ F16L 13/04
U.S. Cl. 285—114 20 Claims

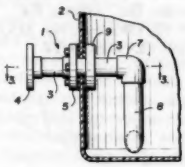


15. A thrust rod anchor for connection to a pipe comprising:
first and second spacers, each having an arcuate portion mountable over a cylindrical portion of said pipe and each having oppositely disposed connector portions extending outwardly from said arcuate portion,
a pair of spaced parallel flanges fixed to each said first and second spacer connector portions, corresponding said pairs of flanges being in abuttable adjacency and having an opening configured to receive a thrust rod when said first and second spacers are operationally positioned about a said pipe;
rigid support means fixed to and extending between each said pair of flanges adjacent said arcuate portion;
a bolt and nut connector extensible through said first and second spacer connector portions outwardly of said flange openings for retaining said first and second spacers in an operational said position about a said pipe; and
support means fixed to the outwardly disposed surface of each said flange and having a threadably tapped bore for receiving a set screw.

4,492,392
TANK FITTING

Arthur F. Woods, Monroe, La.; Harry Bush, St. Louis, Mo., and Eugene J. Kana, Pittsburgh, Pa., assignors to Poly Processing Company, Inc., Monroe, La.

Filed Jan. 19, 1983, Ser. No. 459,235
Int. Cl.³ F16L 5/02
U.S. Cl. 285—119 1 Claim

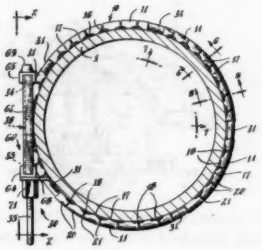


1. A tank fitting comprising, a plastic pipe, said pipe extending through a side wall of a cylindrical plastic tank, a plastic flange integrally formed on said pipe in proximity to the exterior curved surface of the tank side wall, another plastic flange slidably mounted on the portion of the pipe within the tank and positioned in proximity to the interior curved surface of the tank side wall, compressible gasket means interposed the exterior surface of the tank side wall and the first-mentioned flange and between the interior surface of the tank side wall and the second-mentioned flange, bolt means extending between said flanges for drawing said flanges toward each other to thereby compress said gasket means axially against the tank side wall to conform the gaskets to the curvature of the tank wall and radially against the pipe to provide a leak-proof connection, the heads of the bolt means being encased within the second-mentioned flange to prevent corrosion of said bolt means; said pipe and associated flanges being positioned in proximity to and above the bottom of the tank side wall, a siphon drain connected to the end of the pipe within the tank to thereby facilitate the draining of the tank; and a third plastic flange integrally formed on the end of the pipe exterior of the tank.

4,492,393
PIPE RESTRAINT DEVICE

Erwin L. Schaub, Manhasset, N.Y., assignor to Parker Hannifin Corporation, Brooklyn, N.Y.

Filed Aug. 31, 1981, Ser. No. 297,574
Int. Cl.³ F16L 21/00
U.S. Cl. 285—236 28 Claims



1. A restraint device to prevent axial separation of two cast iron pipes or the like joined end to end by a sealing coupling, comprising:
at least one stiff yet forceably springable rod having lengths thereof pre-bent circularly to substantially the outside curvature of the pipes and forming two coils spaced apart axially a distance sufficient for said coils to encircle respective surfaces of said pipes that border said coupling at opposite sides of said coupling, each of said coils having at least nearly its entire length disposed on a single plane perpendicular to the axis of said coils,
said at least one rod having substantially tangentially extending end portions thereof arranged in oppositely directed pairs defining a contractable region of said coils,
axial restraining means to engage against said pipe surfaces and engaged with and interconnecting at least major portions of the respective lengths of said coils for constraining said coils to said distance of axial spacing, and
means for displacing respective rod end portions of said pairs one relative to another substantially tangentially and holding them displaced under tension sufficiently great to contract said coils and said restraining means into immovable tight engagement upon said pipe surfaces.

4,492,394
ADJUSTABLE-GRIP LATCH

Donald J. Dignan, South Euclid, Ohio, assignor to The Eastern Company, Cleveland, Ohio

Filed Feb. 25, 1982, Ser. No. 352,311
Int. Cl.³ E05C 3/04
U.S. Cl. 292—64 24 Claims

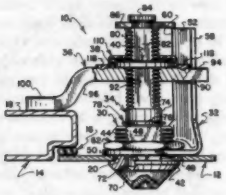
1. A latch, comprising:
(a) a shaft of generally round cross section having threads on at least a part of the shaft;
(b) stop means;
(c) mounting means mounting the shaft for rotation about an axis, and positioning the stop means near the shaft;
(d) pawl means carried by the shaft for threadably engaging the threaded part of the shaft, the pawl means including

friction drive means for transmitting limited torque from the shaft to the pawl means to urge the pawl means to rotate about the axis together with the shaft;

(e) the pawl means and the stop means being configured such that:

(i) when the shaft is rotated about the axis in one direction, torque is transmitted from the shaft to the pawl means through the friction drive means to rotate the pawl means with the shaft toward a latched position wherein the pawl means engages the stop means, and, once the pawl means has engaged the stop means, to thereafter restrain further rotary movement of the pawl means as the shaft continues to be rotated, whereby the threaded engagement between the shaft and the pawl means causes the pawl means to travel axially along the shaft as the shaft is rotated relative to the pawl means;

(ii) when the shaft is rotated about the axis in the opposite direction, torque is transmitted from the shaft to the



pawl means through the friction drive means to rotate the pawl toward an unlatched position wherein the pawl means engages the stop means, and, once the pawl means has engaged the stop means, to thereafter restrain further rotary movement of the pawl means as the shaft continues to be rotated, whereby the threaded engagement between the shaft and the pawl means causes the pawl means to travel axially along the shaft as the shaft is rotated relative to the pawl means;

(f) the friction drive means including:

(i) a compressible spring washer which extends about a part of the shaft, the washer having opposed, axially-spaced face portions which may be compressed relatively axially in opposition to the spring action of the spring washer; and,

(ii) connection means compressively engaging the opposed face portions of the spring washer and establishing a frictional drive connection for transmitting torque from the shaft to the pawl means.

4,492,395

AUTOMOTIVE DOOR LATCH SYSTEM INCLUDING A CHILDPROOFING MECHANISM

Shinjiro Yamada, Tokyo, Japan, assignor to Mitsui Kinzoku Kogyo K.K., Tokyo, Japan

Filed Aug. 2, 1982, Ser. No. 404,524

Claims priority, application Japan, Aug. 7, 1981, 56-122922; Aug. 7, 1981, 56-122923

Int. Cl.³ E05C 3/06

U.S. Cl. 292—216 **8 Claims**

1. An automotive door latch system operable by both outside and inside handles on a vehicle door, comprising:

(a) a striker attached to a vehicle body;

(b) a main body attached to the vehicle door, the main body having a guideway for receiving the striker when the vehicle door is in a closed position relative to the vehicle body;

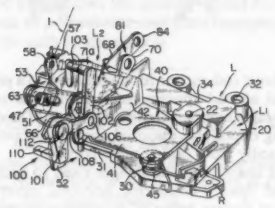
(c) a latch member movably mounted in the main body and adapted to engage the striker in the guideway for holding the vehicle door in the closed position;

(d) a ratchet engageable with the latch member to inhibit its motion in a direction to disengage the striker, the latch member and the ratchet being disposed in coplanar relation to each other and being the sole members mounted in the main body;

(e) a bracket formed in rigid relation to the main body and having at least a portion upstanding on the outside of the main body, the upstanding portion of the bracket being oriented normal to the plane of the latch member and the ratchet; and

(f) lever means mounted on the upstanding portion of the bracket for pivotal motion in a plane parallel to the upstanding portion, said lever means comprising:

(1) an actuating lever mounted on a pivot for acting directly on the ratchet to cause the same to disengage the latch member;



(2) an outside release lever mounted on said pivot and operatively linked to the outside handle to be pivoted thereby;

(3) an inside release lever mounted on said pivot and operatively linked to the inside handle to be pivoted thereby, the inside release lever being normally in abutting contact with the outside release lever to cause pivotal motion thereof in response to the actuation of the inside handle whereby the outside release lever is pivoted in the same direction upon actuation of the outside handle and of the inside handle; and

(4) means for transmitting the pivotal motion of the outside release lever to the actuating lever to cause the latter to act on the ratchet.

4,492,396

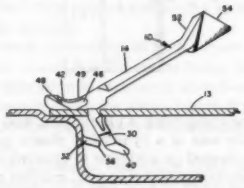
ONE-PIECE, SLAM-TYPE LATCH FOR SNAP-IN INSTALLATION

Roger D. Luke, Clifton Park, N.Y.; Wayne A. Ingram, Stone Mountain, and Michael S. Jarrell, Decatur, both of Ga., assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Oct. 28, 1981, Ser. No. 315,773

Int. Cl.³ E05C 3/14

U.S. Cl. 292—228 **13 Claims**



1. A one-piece, slam-type latch for snap-in installation in an orifice provided in a pivotal door for maintaining the door in a closed position relative to a door frame having keeper means extending from the inner side of said door frame, comprising:

a first portion for placement on an outer surface of said door;

a second portion extending outward from said first portion for insertion through said orifice, said second portion

being in integral attachment with one side of said first portion;

a third portion in integral engagement with said second portion and substantially coplanar with the first portion, said third portion having a thin-walled section being sufficiently flexible to allow said third portion to be deformed;

means on said second portion, cooperating with said keeper means for increasiong resistance against pivotal movement of said door with increases in pressure on the inside of the door; and

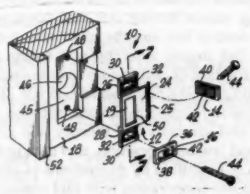
a fourth portion integrally attached to one end of said first portion opposite the end that said second and third portions are attached to, said fourth portion extending angularly outward from said first portion away from said second portion, said fourth portion having sufficient dimensions to allow at least one finger of a latch operator to be placed between said door and said fourth portion when said second portion is inserted through said orifice, said second portion having a camming surface extending from one end of said second portion opposite the end of said second portion attached to said first portion, said camming surface extending angularly toward said fourth portion, said camming surface being provided to contact said keeper means of said door frame to cause said flexible thin-walled section of said third portion to deform as said door is closed when said second portion is inserted through said orifice, said thin-walled section being provided with an angular nib for prevention of excessive deformation of said thin-walled section.

4,492,397

ADJUSTABLE STRIKE

Howard M. Allenbaugh, Fountain Valley, Calif., assignor to M.A.G. Engineering & Manufacturing Co., Inc., Gardena, Calif.

Filed Oct. 26, 1981, Ser. No. 314,561
Int. Cl.³ E05C *13/00*
U.S. Cl. 292—341.18 **6 Claims**



1. An adjustable strike comprising:

a strike plate having an aperture therein to receive a bolt or latch, upper and lower interlock surfaces above and below said aperture, respectively, corresponding upper and lower back surfaces on the opposite side of said strike plate from said interlock surfaces, a plurality of closely spaced parallel vertical grooves on each of said interlock surfaces and said back surfaces, and upper and lower horizontally elongated screw holes above and below said aperture, respectively; and

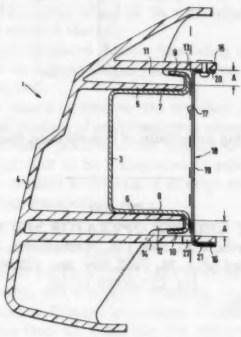
separate and independently movable upper and lower keeper plates each having a screw hole therein and an interlock surface thereon, said interlock surfaces each having a plurality of closely spaced parallel vertical grooves thereon adapted to slidably engage said grooves of said strike plate, said keeper plates being so configured as to align said screw holes thereof with said screw holes of said strike plate while mating said interlock surfaces thereof with said interlock surfaces of said strike plate, whereby said strike plate can be secured to a door jamb in any of a plurality of horizontally and vertically displaced interlock positions relative to said keeper plates with said back surfaces engaging said door jam.

4,492,398

RESILIENT VEHICLE BUMPER INDIRECTLY SECURED TO A RIGID SUPPORT

Dietmar Peter, Hemmingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Apr. 23, 1982, Ser. No. 371,205
Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117379
Int. Cl.³ B60R *19/08*
U.S. Cl. 293—120 **9 Claims**



1. A bumper for vehicles, and more particularly, for motor vehicles, comprising a rigid support of U-shaped cross section and a resilient guard, said rigid support including holding fixtures and the guard having at least one pair of generally vertically aligned guide bars resting against opposed parallel legs of the U-shape of the rigid support, said guide bars and holding fixtures interacting in a reinforcing manner, said resilient guard including generally horizontally disposed cross bars which are located at a vertically-spaced distance from respective guide bars, said cross bars including portions protruding beyond a generally vertical boundary plane delimiting the rigid support, and fastening link means for interconnecting only the protruding portions of the cross bars beyond the generally vertical boundary plane to thereby indirectly secure the guard to the rigid support.

4,492,399

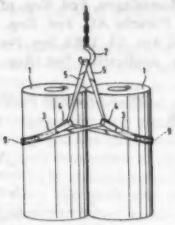
LIFTING HARNESS FOR LIFTING OF A LOAD CONSISTING OF TWO OR MORE ESSENTIALLY CYLINDRICAL OBJECTS IN AN UPRIGHT POSITION

Ilkka U. Randen, Rauma; Mikko Kiema, and Lauri S. Porthen, both of Turku, all of Finland, assignors to Lassila & Tikanoja Oy, Helsinki, Finland

Filed May 21, 1982, Ser. No. 380,943
Claims priority, application Finland, May 27, 1981, 811620; Oct. 29, 1981, 813402; Nov. 10, 1981, 813559; Feb. 15, 1982, 820495
Int. Cl.³ B66C *1/18*
U.S. Cl. 294—74 **12 Claims**

1. A lifting harness for lifting of a load of two essentially uniform surfaced cylindrical objects in an upright position, characterized in that it comprises two lifting slings, which are intended to be applied around the load from opposite sides, the ends of one of the lifting slings are fashioned into eyes, said one lifting sling has additionally at least one eye adjacent at least one of its ends, and the other lifting sling is extended by a

lifting loop which is threaded through two of the eyes of said one lifting sling and stretches upwards to a lifting means; said harness consisting essentially of non-metallic materials without hardware.

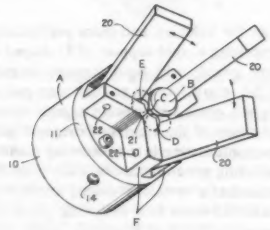


4,492,400

ROBOTIC GRIPPER OPERATOR MECHANISM

Lawrence F. Yuda, P.O. Box 176, Westminster, S.C. 29693

Filed Mar. 28, 1983, Ser. No. 479,502
Int. Cl.³ B25J *15/00*
U.S. Cl. 294—88 **5 Claims**



1. A robotic gripper having a housing carrying a fluid-operated piston with a plunger connected in axial alignment therewith comprising:

a plurality of gripping fingers each pivotally connected to said housing adjacent said plunger;

a transverse arcuate groove in said plunger opposite each of said fingers;

a corresponding groove in each finger opposite a said first mentioned groove and forming respective seats therewith; and

a free bearing member retained within each of said respective seats formed by opposed respective grooves;

whereby a power stroke operating said fingers is exerted responsive to a power stroke of said piston.

4,492,401

NON-MARRING LIFTING CLAMP

Charles J. Renfroe, and William Davies, both of Jacksonville, Fla., assignors to J. C. Renfroe and Sons, Inc., Jacksonville, Fla.

Filed Jun. 14, 1983, Ser. No. 504,313
Int. Cl.³ B66C *1/48*
U.S. Cl. 294—101 **14 Claims**

1. A lifting clamp for articles such as metal plates comprising:

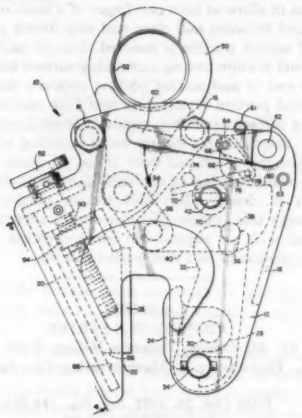
a clamp body including a pair of spaced side plates, said body defining a slot through said side plates to receive an article to be lifted;

a pair of opposed jaws mounted on opposite sides of said slot, one of said jaws being a gripping jaw pivotally mounted for opening and closing movements relative to the other jaw;

a shackle mounted for guided movement in said clamp body and adapted for connection to a lifting force;

a linkage assembly in said body coupling said shackle to said gripping jaw to control movements of said gripping jaw between a jaw closing position and a jaw open position, said assembly including a swing link carrying said gripping jaw and connected to move said gripping jaw through said opening and closing movements, and a control link pivoted to said side plates with first and second connecting means coupling said control link to said shackle and to said swing link, respectively; and

locking means having a manually operated handle pivotally mounted on said clamp body and spring means between said side plates connected to act on said linkage assembly, said spring means having one end constrained to pivot with said control link and the other spring end connected to a cam link means whereby said spring means is tensioned by rotation of said handle to urge said assembly and thereby said gripping jaw toward said jaw closing position and the tension released by reverse rotation of said handle to release said assembly and thereby said gripping jaw to move to said jaw open position, said cam link means being connected to be shifted by movements of said handle, said cam link means cooperating with said control link through said spring means to bias said control link to said jaw closing position or release said assembly to said jaw open position.



4,492,402

COIL UP-ENDING GRAB

Harvey Bradley, East Prospect, Pa., assignor to Bradley Lifting, Corp., York, Pa.

Filed Mar. 28, 1983, Ser. No. 479,697
Int. Cl.³ B66C *1/22*
U.S. Cl. 294—103 CG **6 Claims**

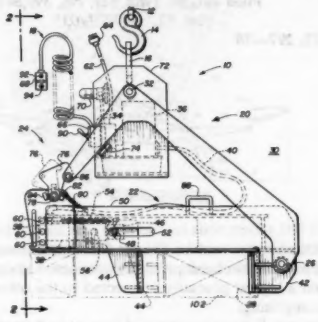
1. A coil up-ending grab adapted for use in combination with an overhead crane, said coil up-ending grab comprising in combination:

a. an inverted L-shaped lever arm assembly having a spaced clevis structure insertably receiving by pivotal mounting means therebetween at the apex junctures of the respective long-leg members and the short-leg members thereof a hydraulic power and control unit with a support structure housing therefor upwardly mounting thereon a grab lifting connector for detachable connection with a crane hook of said overhead crane,

b. a clamp deck provided with a fixed jaw and a moveable

jaw adapted to engage coils for up-ending, said clamp deck insertably received pivotally within said spaced clevis structure of said inverted L-shaped lever arm assembly the long-leg member end thereof by a pintle means retainably inserted through a transverse set of aligned openings therein cooperatively with a corresponding opening provided within said clamp deck the fixed jaw end thereof, and

c. a latch-and-pin assembly comprised of a pivotal latch means connectably assembled the moveable jaw end of



said clamp deck upwardly thereof and adapted to releasably engage a pin means fixedly assembled transversely said inverted L-shaped lever arm assembly spaced clevis structure the short-leg member end thereof whereby a reel of coiled strip material compressively engaged between the fixed jaw and moveable jaw of said clamp deck may be up-ended from a core axis vertical to a core axis horizontal disposition upon release of said latch-and-pin assembly and elevation of said crane hook when cooperatively engaged with said grab lifting connector.

4,492,403

METHOD AND APPARATUS FOR SECURING A WHEELCHAIR TO A VEHICLE FLOOR

Kenneth E. Blomgren, P.O. Box 33, Spicer, Minn. 56288, and Louis B. Oberhauser, 2425 Dunwoody Ave., Wayzata, Minn. 55391

Filed Jul. 1, 1982, Ser. No. 394,450
Int. Cl.³ B60N *1/02*; B60P *3/06, 7/08*; B62B *11/00*
U.S. Cl. 296—65 R **16 Claims**

1. Wheelchair transport apparatus comprising:

(a) a vehicle having a floor;

(b) a pair of separate elongated flexible tensioning means each having intermediate portions constructed and arranged to engage and extend along the upper periphery of one of the large wheels of the wheelchair to be transported and to prevent axial slippage with respect thereto;

(c) a pair of anchor means carried by said floor and securing one end portion of each of said tensioning means to said floor at points spaced from each other a distance approximating the axial spacing of the large wheels of the wheelchair chair to be transported;

(d) a pair of keeper means secured to said floor, each in aligned spaced relation with one of said anchor means and spaced therefrom a distance somewhat greater than the diameter of the large wheel of the wheelchair to be transported and secured thereby;

(e) each of said elongated flexible tensioning means extending through its aligned keeper means in free-sliding, piercing relation; and

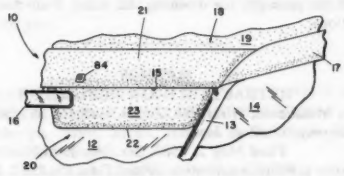
(f) connector means carried by the terminal portion of the opposite end portion of said tensioning means for connecting said terminal portion under tension to the frame of such a wheelchair to be transported to preclude rotation of the chair relative to the axis of its large wheel while the latter is being transported.

4,492,404

VISOR ACTUATING MECHANISM

Konrad H. Marcus, and Dennis J. Fleming, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

Filed Dec. 27, 1982, Ser. No. 453,530
Int. Cl.³ B60J *3/02*
U.S. Cl. 296—97 J **17 Claims**



1. A visor actuating mechanism for use with a visor assembly including a visor body and means for movably mounting the visor body to a vehicle for movement between stored and use positions, said actuating mechanism comprising:

bias means having one end coupled to said mounting means for urging the visor body toward the use position and selective coupling means for disengagably coupling an opposite end of said bias means to said visor body such that said visor moves free of said bias means upon movement of said visor body a predetermined distance from said stored position; and

means for releasably holding the visor body in a stored position against the force provided by said bias means such that the visor can be automatically moved from a stored position by actuating said holding means to release the visor body.

4,492,405

SEALING STRUCTURE FOR AUTOMOTIVE VEHICLE SIDE DOORS

Takayo Chikaraishi, Kawasaki; Yoshimasa Tuchiya, Ebina, and Kazunori Kawamo, Atsugi, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Nissan Shatai Company, Limited, Hiratsuka, both of, Japan

Filed Jul. 14, 1983, Ser. No. 513,401
Claims priority, application Japan, Jul. 16, 1982, 57-124192
Int. Cl.³ B60J *5/04*
U.S. Cl. 296—146 **14 Claims**

1. In an automotive vehicle having a front door, a rear door the front vertical edge of which opposes to the rear vertical

edge of said front door, upper and lower vehicle body side members extending along the upper and lower edges respectively of a door opening to be covered by said front and rear doors, and a roof panel having edge associated with said upper vehicle body side member for defining a drip-channel,

a sealing structure comprising:

first and second seals mounted on said upper vehicle body side member, each adapted to sealingly contact the upper edges of said front and rear doors when the latter are in their closed positions;

a third seal mounted on the rear vertical edge of said front door and adapted to sealingly contact the front vertical edge of said rear door;

a fourth seal mounted on the front vertical edge of said rear door and adapted to sealingly contact said third seal along a locus of points of said third seal different from the locus of points along which the front vertical edge of said rear door contacts said third seal; and

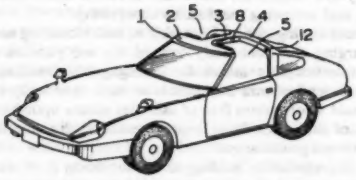
said third and fourth seals have top sections positioned beneath said drip-channel and adapted to receive any water passing between said first seal and said upper edges of the front and rear doors, and said third and fourth seals define drain passages for draining the water from said top sections.

4,492,406

RETRACTABLE AIR DEFLECTOR

Tooru Matsubara, Hiratsuka, Japan, assignor to Nissan Shatai Company, Limited, Japan

Filed May 2, 1983, Ser. No. 490,669
Claims priority, application Japan, Dec. 29, 1982, 57-229588
Int. Cl.³ B60J 7/22
U.S. Cl. 296—217 **5 Claims**



1. A retractable air deflector for an at least partially open automobile top, comprising:

an air deflector member; and

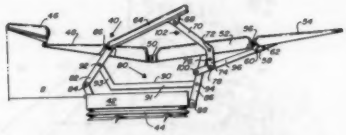
a support means supporting the air deflector member on the fixed automobile top on the front end of an opening in the automobile top; the support means being adapted to move the air deflector between an operative protruding above the contour surface of the automobile top and a retracted position submerged below the contour surface of the automobile top as a substantially parallel translation; the support means being so biased that the air deflection member is normally biased toward its operative position and may be pushed into its retracted position when the air deflector is subjected to a certain downward force which may be produced by pushing a detachable roof over the air deflector member and the opening of the automobile top; wherein the support means is comprised of at least a pair of parallel links which are pivoted to the air deflector member at their one ends and pivoted to a fixed automobile top on the front end of the opening in the automobile top.

4,492,407

PATIENT SUPPORT AND TRANSVERSE MOTION LINKAGE THEREFOR

James H. Broadhead, Bay Minette, Ala., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 19, 1982, Ser. No. 399,561
Int. Cl.³ A47C 1/035
U.S. Cl. 297—78 **17 Claims**



1. A transverse motion linkage for a patient support having a base, a seat, a backrest pivotally connected to one end of said seat and a legrest pivotally connected to the other end of said seat, comprising:

a four-bar linkage having said base as its bottom link, a rear link pivotally connected between said bottom link and the backrest, a front link pivotally connected between said bottom link and the seat, and a horizontal link pivotally connected between said rear link and said front link, and

a three-bar linkage having a first link, a second link and a third link, said first link pivotally connected at one end to said legrest and at the other end to said second link, said second link pivotally connected at its end remote from said first link to said third link and pivotally secured at an intermediate portion to said seat, said third link pivotally connected at its end remote from said second link to said backrest at substantially the level of its connection to said rear link of said four-bar linkage,

whereby moving said patient support transversely forward on said four bar linkage reclines said backrest and raises said legrest so that the ratio of the horizontal distance between said backrest and the back end of said base in the fully reclined position, compared to said horizontal distance in the fully upright position, is about 1.5 to 1.

4,492,408

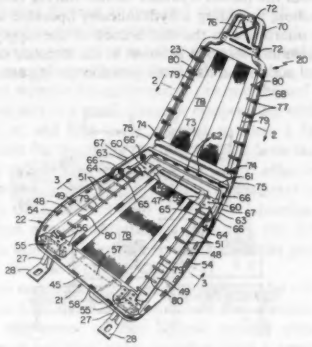
VEHICLE SEAT CONSTRUCTION AND METHOD OF MAKING THE SAME

Thomas E. Lohr, Harrison Township, Macomb County, Mich., assignor to Allen Industries, Inc., Troy, Mich.

Filed Jan. 19, 1982, Ser. No. 340,681
Int. Cl.³ A47C 1/02
U.S. Cl. 297—344 **7 Claims**

1. In a longitudinally adjustable vehicle seat construction comprising a lower structural substantially rectangular seat frame means, a seat cushion means supported by said lower seat frame means, and upper slide means carried by said construction for sliding longitudinally on fixed lower slide means carried by a vehicle to thereby permit longitudinal adjustment of said seat construction in said vehicle, said upper slide means comprising a pair of spaced apart substantially parallel slide tracks that form a structural part of said lower structural seat frame means, each said slide track having a generally C-shaped cross-sectional configuration with a bight that faces said fixed lower slide means so as to receive said fixed lower slide means therein and being provided with a front end and a rear end, the improvement wherein said seat frame means comprises a front structural portion that has opposed ends respectively secured to said front ends of said slide tracks and extends in a forward

direction beyond said front ends, said seat frame means comprising a rear structural portion that has opposed ends respectively secured to said rear ends of said slide tracks and extending in a rearward direction beyond said rear ends whereby said slide tracks define side portions of said seat frame means.

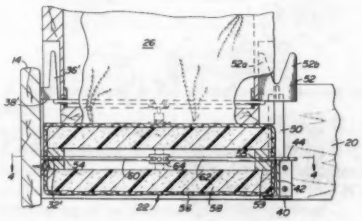


4,492,409

FURNITURE WITH REMOVABLE PADDED CUSHIONS

William B. Laird, 121 First Ave, Red Lion, Pa. 17356

Continuation-in-part of Ser. No. 237,338, Feb. 23, 1981, Pat. No. 4,395,071. This application Oct. 20, 1982, Ser. No. 435,436
The portion of the term of this patent subsequent to Jul. 26, 2000, has been disclaimed.
Int. Cl.³ A47C 4/02
U.S. Cl. 297—440 10 Claims



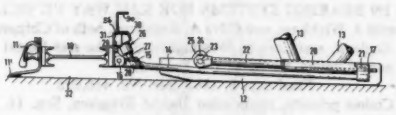
1. Furniture of the chair, loveseat and couch type comprising a frame having at least one removable cushion, said cushion having oppositely disposed grooves, a pair of tongues on said frame, each tongue projecting into one of said grooves, latch means within said cushion, said latch means including a latch member projecting into at least one of the grooves on the cushion for latching cooperation with mating structure on the associated tongue, an actuator on the cushion connected to the latch member for releasing the latch member so that the cushion may be removed, a plate having a non-circular keyhole attached to said cushion, said actuator being aligned with said keyhole for reception of a key and being generally perpendicular to said latch member at a rear end of said cushion.

4,492,410

APPARATUS FOR CONTROLLING THE POSITION OF A MINERAL MINING MACHINE

Horst Schlüsener, Werne, and Norbert Hesse, Lünen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalia, Lünen, Fed. Rep. of Germany

Filed Apr. 30, 1982, Ser. No. 373,548
Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117401
Int. Cl.³ E21C 27/32
U.S. Cl. 299—43 15 Claims



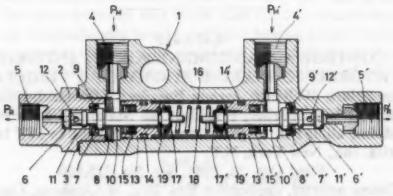
1. In apparatus for controlling the position of a mineral machine movable along a guide on one side of a conveyor and comprising bracket means on a side of the conveyor opposite said one side, at least one elongate rod guided for displacement on a roof support, connection means effecting pivotal connection between the conveyor and said rod and at least one inclined piston and cylinder unit connected between the connection means and the bracket means and operable to adjust the guide; the improvement wherein the piston and cylinder unit has its cylinder coupled to the bracket means with a ball-and-socket joint located above a pivot connection between the conveyor and the connection means, and the connection means has a pocket for receiving a lower region of the piston rod of said unit which is connected to the connection means with a lower pivot joint.

4,492,411

BRAKE PRESSURE CONTROL VALVE WITH A DISABLER FOR SPLIT BRAKING SYSTEM

Michio Moriya, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Japan

Filed Oct. 21, 1982, Ser. No. 435,891
Claims priority, application Japan, Oct. 29, 1981, 56-174048; Apr. 22, 1982, 57-59075[U]; Apr. 22, 1982, 57-59076[U]
Int. Cl.³ B60T 8/26, 11/34, 17/18
U.S. Cl. 303—6 C 3 Claims



1. In a brake pressure control valve with a disabler for a split braking system having two brake circuits having a valve body having two pairs of fluid inlets and outlets and formed with a bore connecting said inlets with said respective outlets, a pair of pressure reducing valves disposed in an opposed relationship and each having a round valve seat of an elastic material mounted in a fixed position with respect to said valve body and a plunger slidably mounted in said valve body and formed with a valve head thereon, at least one spring for urging said plungers in such a direction that the respective of said pressure reducing valves will open, and piston means slidably mounted on said plungers at inner end thereof, said piston means being in a neutral balanced position when the fluid pressure in one brake circuit is substantially equal to that in the other brake

circuit and being movable toward the circuit that failed, if one brake circuit should fail, the improvement comprising engaging means for bringing said piston means into engagement with said plunger in the live circuit when said piston means has moved toward the failed circuit for a predetermined distance, whereby forcibly moving said plunger in the live circuit toward the failed circuit, so that the valve head on said plunger in the live circuit will pass through said valve seat and thus said pressure reducing valve in the live circuit is disabled.

4,492,412

BRAKING CYLINDER INLET VALVE ARRANGEMENT IN BRAKING SYSTEMS FOR RAILWAY VEHICLES

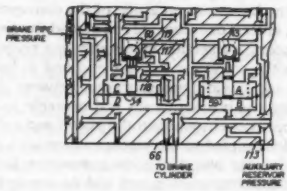
David J. Wickham, and Clive A. Rathband, both of Chippenham, England, assignors to Westinghouse Brake and Signal Company Limited, Chippenham, England

Filed Sep. 8, 1982, Ser. No. 416,075

Claims priority, application United Kingdom, Sep. 11, 1981, 8127542

Int. Cl.³ B60T *15/20*

U.S. Cl. 303—32 **3 Claims**



1. A brake cylinder inlet valve arrangement for the braking system of a railway vehicle including a brake pipe pressure, an auxiliary reservoir pressure, and a brake cylinder, said brake cylinder inlet valve arrangment comprising:

an actuating means for said brake cylinder inlet valve means for opening said valve means when supplied with an axiliary reservoir pressure; and means for opening said valve means when supplied with an auxiliary reservoir presure; and

an application valve means for supplying auxiliary reservoir pressure to said actuating means only when said brake pipe pressure is less than said auxiliary reservoir pressure such that said brake cylinder inlet valve means is interlocked so as to be not actuatable until said application valve means is first actuated.

4,492,413

CONTROL ARRANGEMENT FOR AN ANTISKID HYDRAULIC BRAKING SYSTEM OF A VEHICLE

Juan Belart, Walldorf; Jochen Burgdorf, Offenbach-Rumpenheim; Dieter Kircher, Frankfurt am Main, and Lutz Weise, Mainz, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 28, 1981, Ser. No. 315,820

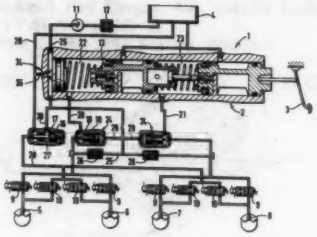
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1980, 3040548

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—92 **28 Claims**

1. A control arrangement for use in hydraulic braking system of a vehicle, particularly of a motor vehicle, equipped with an antiskid control device, for controlling the operation of at least one brake actuating cylinder interposed in a braking circuit between a supply conduit having a first and a second branch respectively communicating with a master cylinder device having at least one master piston and with an auxiliary energy pressure source at their upstream ends and merging with one another upstream of the brake actuating cylinder, said auxiliary pressure source responsive to antiskid control action for generating elevated hydraulic pressure and a return conduit connected to a supply reservoir at its downstream end, in dependence on the operation of the antiskid control device and of the auxiliary energy source, the invention comprising:

means for hydraulically separating the brake actuating cylinder from the master cylinder device during antiskid control action, including a hydraulically operated separating valve interposed in the first branch of the supply conduit and assuming its open position in the absence of antiskid control action and its closed position during antiskid con-



trol action and when the auxiliary energy source is operational in response to elevated hydraulic pressure; and

means for hydraulically connecting the brake actuating cylinder to the auxiliary energy source during antiskid control action, including a check valve interposed in the second branch of the supply conduit and assuming its open position when the pressure prevailing upstream thereof exceeds that prevailing downstream of the same.

4,492,414

REGULATOR VALVE FOR HYDRAULIC ANTI-SKID APPARATUS

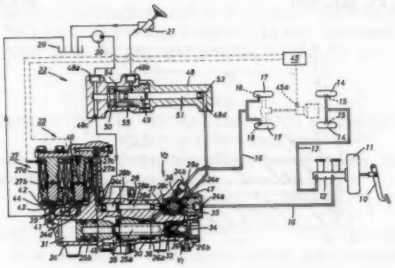
Asao Kozakai, Anjo; Shingo Watanabe, and Nobuyasu Nakanishi, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed May 27, 1983, Ser. No. 498,855

Claims priority, application Japan, Jun. 23, 1982, 57-109013

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—116 **3 Claims**



1. A regulator valve for a hydraulic anti-skid apparatus for installation in a vehicle braking system between a master cylinder and a wheel brake cylinder, the regulator valve comprising:

a housing provided with first and second inlet ports respectively for connection to a hydraulic power pressure source and said master cylinder and with first and second outlet ports respectively for connection to a fluid reservoir and said anti-skid apparatus;

a first valve member in the form of a piston reciprocable within an axial bore in said housing and subdividing the interior of said housing into a first chamber in open com-

munication with said first inlet and outlet ports and said second outlet port and a second chamber in open communication with said second inlet port, said first valve member being formed at one end thereof with a valve part exposed in said first chamber;

a second annular valve member arranged in said first chamber coaxially with said first valve member, said second valve member being formed at one end thereof with a first valve part in a small diameter cooperating with the valve part of said first valve member to form a first annular throttle for throttling the flow of fluid from said first inlet port to said first outlet port and at the other end thereof with a second valve part in a large diameter cooperating with the inner end wall of said first chamber to form a second annular throttle for throttling the flow of fluid from said first inlet port to said first outlet port after said first throttle is closed; and

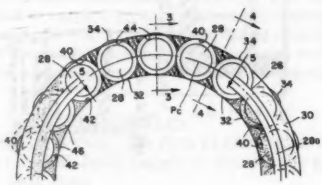
resilient means for biasing said second annular valve member toward the inner end wall of said first chamber to restrict the movement of said second annular valve member toward said first valve member until a power pressure from said power pressure source reaches a predetermined value.

4,492,415

UNITARY FULL COMPLEMENT BEARING COMPONENTS CONTAINING ROLLING ELEMENTS IN A SELF-SUPPORTING LUBRICATING MATRIX

George H. Balle, Beach Haven, N.J., and John J. Johnson, Wayne, Pa., assignors to SKF Industries, Inc., King of Prussia, Pa.

Filed Mar. 3, 1982, Ser. No. 354,501
Int. Cl.[3] F16C *33/38, 33/44, 33/56;* C10M *5/00*
U.S. Cl. 384—463 24 Claims



1. A component of a full complement bearing assembly comprising:

a. a plurality of rolling elements;

b. a self-supporting lubricating matrix composed of a solid, tough, elastic gel comprising a lubricating oil and a high molecular weight polymer, and being capable of exuding lubricating oil in response to sliding friction;

c. means defining a plurality of pockets in said matrix of a configuration closely conforming to the rolling elements and each pocket having at least one opening to expose at least one operative surface of each rolling element permitting rolling contact with another bearing element;

d. said matrix acting to positively space said rolling elements in said assembly and hold them in place to permit or facilitate assembly of said rolling elements to said bearing as a unit and to maintain said rolling elements in properly spaced relation during operation of said bearing; and

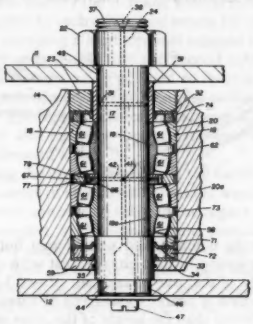
e. said rolling elements being in the form of a circular bracelet having an axial bore severed at least at one location to form a split ring capable of being temporarily deformed to permit its installation over the retaining flanges of the inner ring of a bearing assembly.

4,492,416

CABLE WHEEL MOUNTING FOR CABLE CARS

Erich Kaufmann, San Leandro, Calif., assignor to D. W. Nicholson Corporation, San Leandro, Calif.

Filed Apr. 18, 1983, Ser. No. 485,951
Int. Cl.[3] F16C *19/30*
U.S. Cl. 384/474 11 Claims



1. In a wheel mounting having a pair of spaced apart supports and a wheel having a hub, said hub having an internal wall surrounding and journaled for rotation on a shaft mounted between said supports, said shaft having a normally vertical axis in use and said wheel having a substantially horizontal plane of rotation, the improvement comprising:

a bearing having concentric spaced apart inner and outer races mounted at said shaft and hub wall respectively and roller bearing members mounted between said races;

said shaft having one end fixed to one of said supports and an opposite end extending through said other support.

a sleeve surrounding said shaft and having its opposite ends positioned for engagement with said other support and an adjacent end of said inner race;

means connecting said opposite shaft end and said support and urging said support to displace said sleeve against said adjacent end of said inner race to lock said inner race and shaft against relative movement;

means clamping said outer race to said hub for rotation with said wheel;

conduit means positioned for introducing lubricating oil to the space between said races, said conduit means extending longitudinally in said shaft and having an oil receiving opening at the normally upper end of said shaft and at least one radially extending passage for discharge of oil into said space; and

sealing means providing oil retention in said bearing.

4,492,417

TAPE CASSETTE STORAGE BOX

Shoichi Saito, and Hideo Shirako, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 318,037, Nov. 4, 1981,. This application Feb. 14, 1984, Ser. No. 580,101
Claims priority, application Japan, Nov. 11, 1980, 55-160966
Int. Cl.[3] A47B *81/06;* B65D *85/67*
U.S. Cl. 312—9 3 Claims

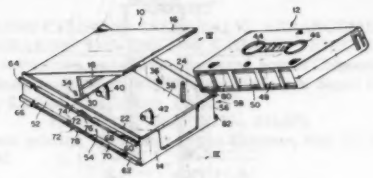
1. A tape cassette storage box comprising:

a storage box body having a hollow for receiving a microcassette;

a cover having a kangaroo pocket for detachably holding the microcassette and coupled with said storage box body so as to be able to rotate about an axis between a first position in which the microcassette held in said kangaroo pocket is located in said hollow of said storage box body and said cover houses, in cooperation with said storage

box body, the microcassette held in said kangaroo pocket, and a second position in which said kangaroo pocket is located outside of said hollow and said cover allows said microcassette as held in said kangaroo pocket to be removed from said storage box body; and

a pair of reel hub stopper members formed on said storage box body and arranged in a direction which crosses the axis of rotation of said cover so as to be able to engage a pair of reel hubs of the microcassette held in said storage



box body wherein said pair of reel hubs are prevented from rotating by said engagement with said reel hubs,

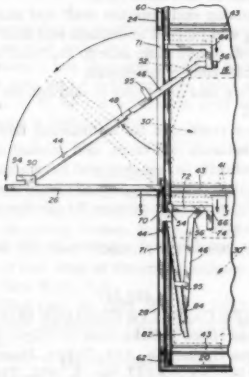
the height of that one of said pair of reel hub stopper members which is nearer to said axis of rotation of said cover being lower than the height of the other one of said pair of reel hub stopper members which is farther from said axis of rotation of said cover so as to facilitate insertion and removal of a microcassette in and from said kangaroo pocket.

4,492,418

LATERAL FILING DRAWERS

Arthur Bailey, deceased, late of Montreal, Canada, and by Vici Bailey, executor, 6300 Lennox, Montreal, Canada, assignors to Vici Bailey, Montreal, Canada

Filed Feb. 24, 1983, Ser. No. 469,447
Int. Cl.³ E05B 65/46
U.S. Cl. 312—220 **7 Claims**



1. A filing cabinet comprising:

a frame defining an enclosure and having two or more drawer openings;

a door hinged to said frame at the bottom of each opening, said door being swingable downward to reach a substantially horizontal opened position and swingable upward to reach a substantially vertical closed position;

link means consisting of a pair of foldable arms piviotally connected to one another at one end thereof, and at the other ends thereof to a respective one of said door and said frame, at each side of said frame to hold said door in said horizontal position;

a drawer at each said opening; said drawer having roller means whereby said drawer may be rolled out of said enclosure onto said door in said horizontal opened position; and

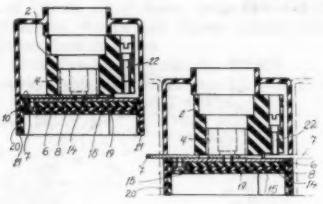
lock receiving means on a rear face of each door at the upper part thereof; one of said arms having its opposite end fixed to said door adjacent said lock receiving means; the other of said arms having finger means at its opposite end; a door locking means consisting of an elongated rail extending vertically of said frame from bottom to top of said enclosure adjacent said openings, and of lever means having one end fixedly attached to said rail and the other end adapted to engage said finger means, the engagement of said lever means being such that, when one door is in the opened horizontal position, all remaining doors are locked as a result of said one end of said lever means being engaged in said lock receiving means of closed doors.

4,492,419

ELECTRIC DISTRIBUTION CENTER

Lennart H. Denckert, Sörgården 125, Danderyd, Sweden (S-186 00)

Continuation of Ser. No. 91,203, Nov. 7, 1979, abandoned. This application Jan. 25, 1982, Ser. No. 342,088
Int. Cl.³ H01R 9/04
U.S. Cl. 339—18 C **12 Claims**



1. An electrical distribution center of the type in which at least one fuse element is adapted to be electrically connected to incoming and outgoing electrical wires and wherein plural such fuse elements are adapted to be positioned in adjacent relation, each fuse element comprising:

a support member having a defined periphery;

plural spaced grooves defined in and extending across said support member;

plural slidable conductors, each positioned for longitudinally slidable movement in respective one of said plural grooves, said slidable conductors each having a length which is shorter than the length of said grooves and having an underside facing into said respective grooves;

plural stationary conductors, one for each slidable conductors, each disposed in slidable contact with the underside of a respective slidable conductor;

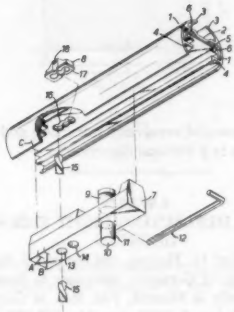
wherein said slidable conductors are each slidable to a position in its respective groove wherein the slidable conductor extends beyond the periphery of said support member and into a groove of a support member of a fuse element positioned adjacent said each fuse element; and

adjustable securing means for selectively pressing said slidable conductors into secure mechanical and electrical contact with said stationary conductors.

4,492,420
ELECTRICAL SUPPLY SYSTEMS

Robert A. Stuart, Newhaven, England, assignor to Rotaflex plc, London, England

Filed Jan. 10, 1983, Ser. No. 457,057
Claims priority, application United Kingdom, Jan. 18, 1982, 8201241
Int. Cl.³ H01R 13/60; B23B 47/28; B23G 1/48
U.S. Cl. 339—22 R 5 Claims

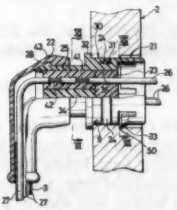


1. In combination a wiring kit and electrical distribution track, said track including a channel having a mouth and a rear wall opposite the mouth, said channel including a plurality of conductors housed in the channel and extending longitudinally thereof, said kit comprising guide means insertable through said mouth into contact with said rear wall, releasable means on said guide means for securing said guide means to said channel at a selected, adjusted position along said track, at least two holes formed in said guide means for guiding a drill bit inserted through said holes toward said rear wall to form openings of predetermined shape in said rear wall, said holes being spaced to enable a series of intersecting openings to be drilled in said rear wall to define a slot shaped opening, and a bushing of electrically insulating material adapted to fit in said opening for protecting supply leads passed therethrough.

4,492,421
LEAK-TIGHT CONNECTOR FOR ELECTRICAL CABLES

Yasunobu Ito, Aichi, Japan, assignor to Aisin Warner Kabushiki Kaisha, Anjo, Japan

Filed Oct. 21, 1981, Ser. No. 313,715
Claims priority, application Japan, Nov. 22, 1980, 55-148714
Int. Cl.³ H01R 11/00
U.S. Cl. 339—59 R 18 Claims



1. A sealed connector for cables passing through a wall of a housing, a hole formed through the wall of said housing, comprising;

a connecting element, said connecting element having at least on its outer periphery, a portion for mating with said hole, said connecting element having at least one passage through the interior thereof;

means for fixing said connecting element in said hole of said housing;

means for connecting together at least one first and at least one second cable, said at least one first cable and at least one second cable each comprising a bundle of electrically conductive wires and a coating over the outer periphery of said bundle of wires, and defining clearances within the coating and between the wires, the coating being stripped from respective ends of the first and second cables which are to be attached to each other, said means for connecting said cables comprising a joint terminal adapted to connect the respective ends of said first and second cables;

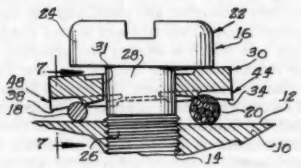
said connecting element being adapted to receive a respective end of each of said at least one first and at least one second cable from opposite sides of said wall of said housing in one of said passages through the interior of said connecting element; and

means for sealing the outer periphery of the bundle of wires and the clearances of at least one of said at least first cable and said at least one second cable in the region where the coating is stripped, said sealing means permeating said clearances and coating said periphery of the bundle of wires with a filler therein in a liquid tight manner, fluid being prevented from leaking out of said housing through the clearances between said electrically conductive wires due to capillary action in the clearances.

4,492,422
WIRE CLAMP ASSEMBLY

Martin Bieschke, Rockford, Ill., assignor to Textron Inc., Providence, R.I.

Filed Dec. 10, 1982, Ser. No. 448,479
Int. Cl.³ H01R 11/20
U.S. Cl. 339—95 R 14 Claims



1. A wire clamp assembly for use with an internally threaded terminal member, said wire clamp assembly comprising in combination: a screw member having an externally threaded shank portion for engagement with said internal thread of said terminal member, a driver head, and an unthreaded shank portion intermediate said head and said threaded shank portion; and a polygonal plate-like washer member having a central aperture and mounted upon said unthreaded shank portion, the plate-like washer member being engageable by said driver head to be moved toward said terminal member for clamping at least one wire therebetween, said washer member having an undersurface for facing said terminal member and a plurality of sides which meet to define corners, said undersurface including rib means associated with at least one side of said polygonal plate-like washer member, said rib means being defined by a pair of spaced apart rib members, each said rib member being disposed substantially radially with respect to the axis of said central aperture in the washer member, and each said rib member extending from an area generally adjacent said central aperture toward the periphery of said one side, said pair of rib members diverging in a direction away from the central aperture and toward said periphery, said rib members intersecting the said one side at spaced locations, both of said locations being intermediate the corners associated with said one side, each said rib member defining a ramp surface protruding from the undersurface of the washer member, said ramp surface gradually increasing in height in a direction from said central

aperture toward said periphery, such that said rib members will bitingly engage a wire to be retained thereby in multi-location contact while urging said wire inwardly toward said central aperture in response to advancement of said washer member toward said terminal member by said screw member.

4,492,423

ROTATABLE HEAVY-CURRENT CONNECTOR

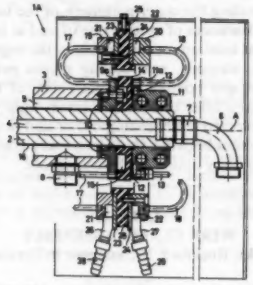
Wolfgang Reuter, Niddatal, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed May 25, 1983, Ser. No. 497,787

Claims priority, application Fed. Rep. of Germany, May 26, 1982, 3219721

Int. Cl.³ H01R *13/533, 39/02*

U.S. Cl. 339—112 L **3 Claims**



1. In a rotatable connector for heavy electrical currents having first and second fluid-cooled conductors, a first flange unit having first and second electrically conducting flanges insulated from each other and physically and electrically connected respectively to the first and second conductors, a second flange unit which is annular and generally coaxially receives in the annular space thereof the first flange unit for relative rotation therebetween, the second flange unit having first and second electrically conducting flanges insulated from each other, the improvement comprising, in combination;

projection means on the first flange of the first flange unit for direct thermal communication of the first flange with the fluid cooling the first conductor connected thereto;

cooling means for providing a cooling fluid inside the second flange of the first flange unit and both flanges of the second flange unit; and

at least two U-shaped stranded wires each embedded at opposite ends of the U thereof in respective pairs of the first and second flanges of the first and second flange units, first flange to first flange and second flange to second flange,

whereby the projection means and cooling means in combination with the embedding of the ends of the U-shaped stranded wires keeps the latter cool enough to carry heavy electrical currents without corroding contact between the stranded wires and cooling fluid.

4,492,424

SOLAR COLLECTOR

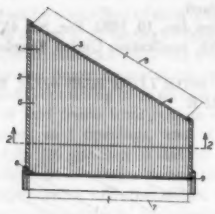
John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Jul. 10, 1981, Ser. No. 282,042

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.10 **1 Claim**

1. A solar collector comprising vertical glass rods enclosed in a housing under a plate glass cover, with the glass rods being of a relatively large diameter of one to six millimeters, with the exposed upper ends of the glass rods being uniformally inclined from horizontal, with the exposed inclined upper ends of the glass rods occupying a common plane, with the lower ends of the glass rods being perpendicular to the vertical axes of the glass rods and occupying a horizontal plane, with the glass rods being supported at their lower ends by a horizontal plate



glass base; as a means of receiving, refracting and transmitting parallel solar rays in a vertical direction.

4,492,425

DEVICE FOR DEFLECTING LIGHT THROUGH 180 DEGREES

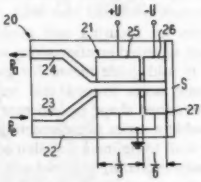
Ralf T. Kersten; Karl H. Tietgen, and Helmut F. Schlaak, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 8, 1982, Ser. No. 338,003

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1981, 3108814

Int. Cl.³ G02B *5/172*

U.S. Cl. 350—96.14 **19 Claims**



1. A device comprising a substrate having a pair of strip waveguides disposed thereon and arranged in a form of a directional coupler and a mirror on a pair of end faces of the waveguides so that light traveling therein is reflected.

4,492,426

OPTICAL BRANCH COUPLER

Antonius J. A. Nicia, and Cornelis J. T. Potters, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 27, 1982, Ser. No. 372,358

Claims priority, application Netherlands, May 4, 1981, 8102183

Int. Cl.³ G02B *7/26;* **F16M** *11/08*

U.S. Cl. 350—96.15 **12 Claims**

1. An optical branch coupler for splitting an incoming light beam from a light source into two outgoing light beams or for combining two incoming light beams from respective light sources into one outgoing light beam, said coupler comprising:

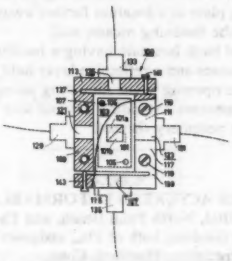
a housing having a bottom wall and first, second and third side walls having openings, said first and second side walls being fixed to the bottom wall substantially perpendicular thereto and substantially parallel to each other, said third side wall being mounted substantially perpendicular to the first and second side walls and to the bottom wall; and

an optical element arranged in the housing between the first and second side walls, said optical element arranged to transmit part of a light beam incident thereon via the opening in the first side wall to the opening in the second

side wall, said optical element arranged to reflect the nontransmitted part of a light beam incident thereon via the opening in the first side wall to the opening in the third side wall;

characterized in that:

the optical element is mounted on a mounting plate which is connected to the bottom wall of the housing by an elastic bridge, said mounting being pivotably adjustable about a



first axis which extends parallel to an optical surface of the optical element and parallel to the bottom wall of the housing;

the third side wall is connected to the first or second side wall so that it is pivotably adjustable about a second axis which extends perpendicular to the bottom wall; and

the coupler further comprises an adjusting screw in the mounting plate to adjust the optical element about the first axis by deforming the elastic bridge.

4,492,427

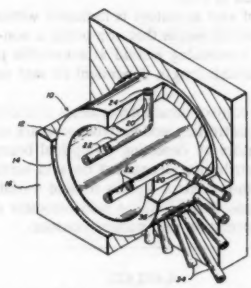
OPTICAL SLIP RING ASSEMBLY

Norris E. Lewis, Christiansburg, and Michael B. Miller, Blacksburg, both of Va., assignors to Litton Systems, Inc., Blacksburg, Va.

Continuation-in-part of Ser. No. 241,588, Mar. 9, 1981, Pat. No. 4,436,367. This application Jan. 25, 1982, Ser. No. 342,197

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.20 **5 Claims**



1. An optical slip ring assembly for coupling an optical signal from a rotor to a stator, the slip ring assembly comprising:

a hollow cylinder comprising said rotor,

a plurality of apertures through said hollow cylinder, said apertures defining a circle around said rotor,

a plurality of rotor optic fibers within said hollow cylinder, said rotor optic fibers having signal emitting ends positioned in said apertures and intersecting the surface of said hollow cylinder prependicularly, and

a plurality of stator optic fibers mounted on said stator, said stator optic fibers having signal receiving ends which collectively define a pickup area and which are arranged concentrically around the circle defined on said rotor by said apertures.

4,492,428

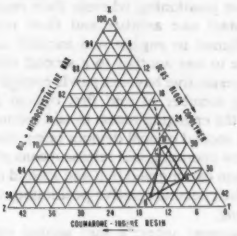
COATED OPTICAL FIBER

Alvin C. Levy, Gwinnett County, Ga., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 315,429, Oct. 27, 1981, Pat. No. 4,432,607. This application Aug. 16, 1982, Ser. No. 408,713

Int. Cl.³ G02B 5/172

U.S. Cl. 350—96.30 **4 Claims**



1. A coated optical fiber comprising an optical fiber and one or more coated layers thereon, characterized in that

at least one coated layer comprises a mixture of: (X) An ASTM type 103, 104A, 104B, or mixture thereof, napthenic or paraffinic oil, with a wax optionally substituted for a portion of said oil; (Y) a styrene-rubber-styrene block copolymer having a styrene-rubber ratio of 0.2 to 0.5; and optionally (Z) a coumarone-indene copolymer or vinyl toluene —α methyl styrene copolymer; and further comprises a thermal oxidative stabilizer, wherein the ingredients X, Y, and Z have relative proportions by weight falling within the shaded area bounded by A'B'C'D' of FIG. 2 for a styrene-rubber-styrene block copolymer having a viscosity of 1190 cps and with the acceptable proportions of said block copolymer adjusted corresponding to a reduction by 3 parts for block copolymer material having a viscosity of 1800 cps, and to an increase by 6 parts for block copolymer material having a viscosity of 500 cps, with said viscosity being measured for a solution of 20 weight percent block copolymer in toluene at 25 degrees Celsius.

4,492,429

MOUNTING DEVICE OF OPTICAL UNIT

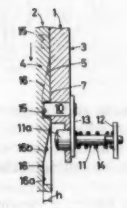
Yukio Miki, Sakai, and Takeshi Egawa, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 21, 1982, Ser. No. 380,872

Claims priority, application Japan, May 25, 1981, 56-79768

Int. Cl.³ G02B 7/02

U.S. Cl. 350—257 **6 Claims**



1. In an optical unit which includes a first optical device and

a second optical device; said first optical device including a body member, a mounting surface connected to said body member, a bayonet pawl on said mounting surface, an engaging member mounted to extend away from said body member and biased to be located away from said body member, and a release means connected to said engaging means to move it toward said body member; said second optical device including a body member, a mounting surface on said body member, a bayonet pawl on said mounting surface, and an engaging recess, said engaging recess being capable of accommodating said engaging member; said first and second optical devices being connectable to one another by placing them together in a first relative positioning wherein their respective mounting surfaces contact one another and their respective bayonet pawls are aligned to engage one another, and then moving them relative to one another to a second relative positioning where their respective bayonet pawls engage one another and the engaging member of said first optical device lockingly extends into the engaging recess in said second optical device, said first and second optical devices being disengageable from one another by operating said release means of said first optical device and then causing said first and second optical devices to move from their second relative positioning to their first relative positioning,

the improvement wherein said second optical device includes a groove therein in which the engaging member of said first optical device will extend when said first and second optical devices are moved from their first relative positioning to their second relative positioning and vice versa, said groove having a first end remote from said engaging recess and a second end adjacent said engaging recess, said groove having a maximum depth at said first end, a minimum depth at said second end and decreasing depth therebetween, said maximum depth being such that said engaging member therein is no more than slightly moved toward its respective body member when said first and second optical devices are in their first relative positioning with respect to one another.

4,492,430

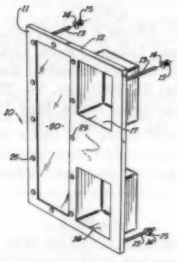
SECURITY MIRROR REPLACEABLE FROM PIPE CHASE

Earl L. Morris, La Habra Hts.; V. Walter Hafner, Whittier, and Ron T. Hahn, Fullerton, all of Calif., assignors to Acorn Engineering Company, City of Industry, Calif.

Filed Jan. 5, 1983, Ser. No. 455,668

Int. Cl.³ G02B *7/18;* A47G *1/16;* E04B *1/38*

U.S. Cl. 350—631 **11 Claims**



1. A vandal-resistant and tamper-proof security mirror assembly with fasteners which are not removable from the viewing side thereof but which are removable and replaceable from the back side of the mounting surface, said mirror assembly comprising:

a mounting plate, having a viewing side and back side, securely affixed over an access hole in a wall, said mounting plate having an opening therein;

fastening means affixed to the mounting plate along the opening therein, said fastening means extending away from the back side thereof, said fastening means being removable from the back side of the mounting plate;

pan means held by said fastening means over the opening in the mounting plate and against the back side thereof, said pan means extending past the edges of the opening along the entire periphery of the opening and said pan means having a side wall extending completely therearound, the inner edge of the side wall abutting the back surface of the mounting plate at a location further away from the opening than the fastening means; and

a mirror and back laminate having a backing layer adjacent the pan means and a reflective layer held against the back side of the opening in the mounting plate, said mirror and backing laminate extending beyond said opening around the entire periphery thereof.

4,492,431

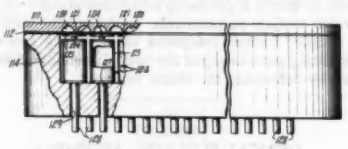
PRESSURE ACTUATED DEFORMABLE MIRROR

Frederick G. Eitel, North Palm Beach, and Thomas J. Hodges, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 4, 1982, Ser. No. 374,680

Int. Cl.³ G02B *7/18, 5/06*

U.S. Cl. 350—310 **4 Claims**



1. A deformable mirror system comprising:

a flexible faceplate having a mirror surface with a surface contour;

a plurality of actuators for determining said surface contour; and

control means for controlling said plurality of actuators, characterized in that:

at least one of said actuators is included within a variable pressure control means that comprises a non-piston pressure vessel containing a fluid at a variable pressure and having a variable length dependent on said variable pressure; and

in which said control means generates a plurality of control signals for controlling said variable pressure in said plurality of actuators by detecting an optical beam having an intensity distribution dependent on said surface contour and generating control signals to said variable pressure control means dependent on said intensity distribution, thereby determining said surface contour.

4,492,432

HOMEOTROPIC NEMATIC DISPLAY WITH INTERNAL REFLECTOR

Meinolph Kaufmann, Rütihof-Baden, and Hanspeter Schad, Rieden, both of Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 14, 1981, Ser. No. 283,175

Claims priority, application Switzerland, Jul. 28, 1980, 5753/80

Int. Cl.³ G02F *1/133*

U.S. Cl. 350—338 **6 Claims**

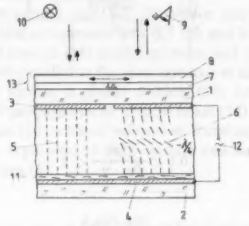
1. A liquid crystal display comprising:

a cell consisting of two plane-parallel plates with a maximal cell thickness of 6 microns;

a pair of electrode layers on the inner surfaces of said two

plane-parallel plates wherein at least one of said electrode layers is transparent;

a nematic liquid crystal having a negative dielectric anisotropy and a double refraction anisotropy between 0.04 and 0.15 and having rubbed orientational surfaces of said two plane-parallel plates to give the nematic liquid crystal a



homeotropic orientation, wherein said rubbed orientational surfaces are treated with silane after rubbing;

an internal reflector mounted on one of said electrode layers and consisting of aluminum flakes and an insulating oxide layer with said aluminum flakes embedded therein;

a polarizer mounted on one of said two plane-parallel plates.

4,492,433

IN-FEM LIQUID CRYSTAL DISPLAY PANEL WITH A FILM OF CELLOPHANE TAPE

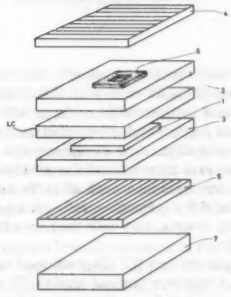
Akihiko Imaya, and Susumu Kitamura, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 28, 1982, Ser. No. 437,507

Claims priority, application Japan, Oct. 28, 1981, 56-161540[U]

Int. Cl.³ G02F 1/133

U.S. Cl. 350—339 R **2 Claims**



1. A liquid crystal display panel comprising:

a pair of polarizers, the polarization axes of the polarizers being substantially orthogonal each other;

a pair of substrates each supporting an electrode;

a film composed of a cellophane tape provided between one of the substrates and one of the polarizers, the film having an optical axis inclined to the polarization axis of said one of the polarizers at about 45°; and

a liquid crystal material disposed between the substrates, molecules of the liquid crystal material being twisted at about 90° between the surfaces of the substrates.

4,492,434

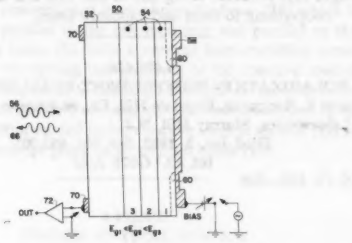
MULTI-COLOR TUNABLE SEMICONDUCTOR DEVICE

Nicholas Bottka, Ridgecrest, Calif.; Howard Lessoff, Potomac, Md., and Marian E. Hills, Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 7, 1982, Ser. No. 337,659

Int. Cl.³ G02F 1/03

U.S. Cl. 350—356 **11 Claims**



1. A detector with a variable bandwidth response for light comprising:

a substrate in the path of said light for transmitting said light;

a plurality of epitaxial layers on said substrate the outermost epitaxial layer with proton bombarded regions, placed such that said light passes through said plurality of epitaxial layers after passing through said substrate, absorbing selected wavelengths;

electrodes attached to the outer surface of the substrate and outer surface of the top epitaxial layer, for maintaining an electric field across said substrate and said epitaxial layers such that a current flows between said electrodes if light is absorbed by any of said epitaxial layers;

means for producing a variable voltage potential across said epitaxial layers in a predetermined manner; and

means for monitoring the current flow from said epitaxial layers as a function of said voltage potential when light is incident on said detector.

4,492,435

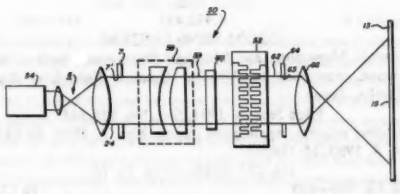
MULTIPLE ARRAY FULL WIDTH ELECTRO MECHANICAL MODULATOR

Martin E. Banton, Fairport; Pierre A. Lavallee, Penfield; Mehdi N. Araghi, West Webster; Joseph J. Daniele, Pittsford, and Kwok L. Yip, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1982, Ser. No. 394,604

Int. Cl.³ G02F 1/29

U.S. Cl. 350—360 **7 Claims**



2. An electro-mechanical modulator for modulating a beam of light to provide an image exposure beam comprising in combination:

(a) a substrate; and

(b) at least two opposing rows of reflectors, each of said reflector rows being comprised of a plurality of separate

closely spaced finger-like reflecting elements on said substrate adapted on interposition into the path of a light beam to reflect the portions of said light beam striking each individual one of said reflecting elements along a first path;

said reflecting elements bending in response to application of a predetermined electrical potential thereacross to reflect the light portion striking said bent reflecting elements along a second path;

light rays reflected along one of said first and second paths cooperating to form said exposure beam.

4,492,436

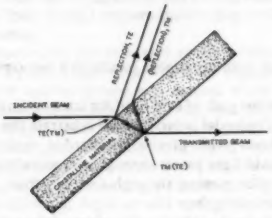
POLARIZATION INDEPENDENT BEAM SPLITTER

Ernest E. Bergmann, Fountain Hill, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 3, 1983, Ser. No. 455,003

Int. Cl.³ G02F 1/01

U.S. Cl. 350—395 **4 Claims**



1. Device comprising:

a beam splitting element,

means for directing a beam of electromagnetic radiation onto the beam splitting element,

means for utilizing the portion of the beam that is reflected by the beam splitting element, and

means for utilizing the portion of the beam that is refracted by the plate beam splitting element,

the invention characterized in that the beam splitting element comprises a first interface reflecting a portion of the incident beam and a second interface reflecting a portion of the beam refracted from the first interface and means between the first and second interface for converting the characteristic polarization TE(TM) to TM(TE) so that the characteristic polarization of the beam incident on the second interface is substantially the complement of the characteristic polarization of the beam incident on the first interface and the combined amount of light that is reflected at both interfaces is independent of the characteristic polarization of the beam.

4,492,437

ZOOM LENS SYSTEM

Hisayuki Masumoto, and Masaichi Shimomura, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 4, 1981, Ser. No. 318,144

Claims priority, application Japan, Nov. 4, 1980, 55-154050; Nov. 4, 1980, 55-154051

Int. Cl.³ G02B 15/14, 15/18

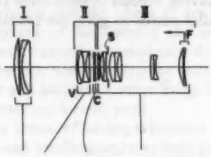
U.S. Cl. 350—428 **19 Claims**

1. A zoom lens system comprising, from the object to the image side:

a front lens group;

a zooming lens group including at least a movable lens group; and

a rear lens group including a fixed lens unit and a variable aperture stip located within the fixed lens unit towards the object side and a focusing lens unit movable on the image side of the fixed lens unit, wherein the lens system fulfills the following condition:



$$0.1 < \frac{|f_F|}{f_{III} \cdot \gamma} < 2$$

wherein:

f_F represents the focal length of the focusing lens unit in the rear lens group;

f_{III} represents the focal length of the whole rear lens group upon infinity focusing; and

γ represents the zoom ratio of the zoom lens system.

4,492,438

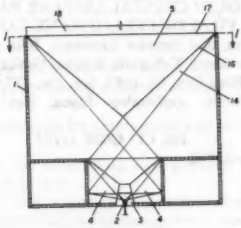
CONICAL WIDE-FIELD MICROSCOPIC LENS

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Feb. 19, 1982, Ser. No. 350,242

Int. Cl.³ G02B 13/08, 21/00

U.S. Cl. 350—432 **1 Claim**



1. A conical wide-field microscopic lens comprising four component lenses (2,3,4,5), with each component lens having one or two conical sections with surfaces which refract light rays at prescribed angles, with all conical sections of the components lenses being aligned on a common axis which is parallel to the incident rays entering and the refracted rays emanating from the microscopic lens, with all surfaces of the component lenses not used for refraction, reflection and transmission of light rays being opaque, and with the four component lenses as described below:

(a) lower component lens RT (2) positioned above the object and having a concave conical section (7) which receives and refracts incident beam (6) outward from the common axis at the prescribed angle, forming conical beam (8), and having a convex conical section (9) normal to the direction of propagation of conical beam (8) so as to receive and emit conical beam (8) without refraction,

(b) first middle component lens RT (3) above and adjacent to lower component lens RT (2) and having a concave conical section (10) which receives and refracts conical beam (8) outward from the common axis at the prescribed angle, and having a convex conical section (11) normal to the direction of propagation of conical beam (8) so as to receive and emit conical beam (8) without refraction,

(c) second middle component lens RLT (4) above and adjacent to first middle component lens RT (3) and having a

convex conical section (12) which receives and refracts conical beam (8) outward from the common axis at the prescribed angle, and having a reflective cylindrical section (13) which receives and reflects conical beam (8) in toward the common axis at the prescribed angle, forming conical beam (14), and having a concave conical section (15) normal to the direction of propagation of conical beam (14) so as to receive and emit conical beam (14) without refraction, and

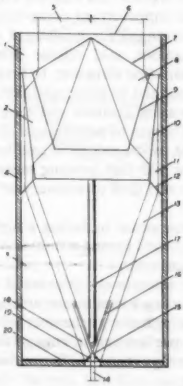
(d) upper component lens RT (5) above and adjacent to second middle component lens RT (4) and having a convex conical section (16) which receives and refracts conical beam (14) parallel to the common axis at the prescribed angle, and having a planar section (17) normal to the direction of propagation of conical beam (14) so as to emit conical beam (14) without refraction, forming whole beam (18) which is parallel to the common axis and parallel to incident beam (6).

4,492,439

MONOCHROMATIC BEAM CONCENTRATOR

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Mar. 15, 1982, Ser. No. 358,468
Int. Cl.³ G02B *13/18*
U.S. Cl. 350—432 1 Claim



1. A monochromatic beam concentrator comprising three component lenses mounted in a tubular casing (4), with each component lens having one or two conical sections with surfaces which refract light rays at prescribed angles, with all conical sections being aligned on a common axis which is parallel to the light rays entering and emanating from the concentrator, with all surfaces not used for the refraction and transmission of light rays being opaque, with the three component lenses as follows;

(a) Upper component lens (1) mounted at the top of the beam concentrator with a planar section (6) which receives a perpendicular incipient beam (5) of light which is transmitted through the lens to the opposite section, and with a concave conical section (7) which receives the incipient beam (5) transmitted from the planar section (6) and separates and refracts the beam out of the upper component lens (1), forming conical beam (8);

(b) Middle component lens (2) mounted below upper component lens (1), with a concave conical section (9) which receives conical beam (8) refracted from concave conical section (7) and refracts the beam through the lens to the opposite section, and with a convex conical section (10) which receives conical beam (8) refracted from concave conical section (9) and refracts the beam out of the middle component lens (2), forming annular beam (11) which is parallel to the common axis; and

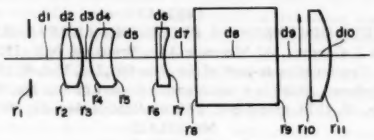
(c) Lower component lens (3) mounted below middle component lens (2), with a convex conical section (12) which receives annular beam (11) refracted from convex conical section (10) and refracts the beam through the lens to the opposite section, forming spectral beam (13), with a concave conical section (15) which receives the spectral beam (13) refracted from convex conical section (12) and refracts the beam out of the lower component lens (3), forming concentrated monochromatic beam (14) which is emitted parallel to the common axis and parallel to the incipient beam (5), with a vertical heat-absorbing metal rod (17) occupying the apex area of the concave conical section (15) so as to intercept portions of spectral beam (13), and with a truncated conical heat-absorbing metal shield (19) mounted inside concave conical section (15) so as to intercept portions of spectral beam (13).

4,492,440

FINDER OPTICAL SYSTEM

Kimihiko Nishioka, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1982, Ser. No. 343,363
Claims priority, application Japan, Jan. 31, 1981, 56-12224
Int. Cl.³ G02B *25/00*
U.S. Cl. 350—445 4 Claims



1. A finder optical system comprising an objective, a field lens, a rectangular field mask placed at the image forming position by said objective, a pentagonal roof prism for bending the optical axis and an eyepiece, said objective, field lens, field mask, pentagonal roof prism and eyepiece being arranged in turn.

4,492,441

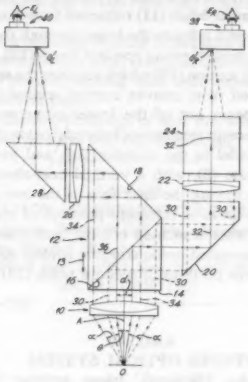
VARIABLE STEREOMICROSCOPE

Harold H. Hopkins, Reading, England, assignor to National Research Development Corporation, London, England

Filed Aug. 16, 1982, Ser. No. 408,283
Claims priority, application United Kingdom, Aug. 17, 1981, 8125085
Int. Cl.³ G02B *21/22*
U.S. Cl. 350—516 9 Claims

1. An optical system comprises a front objective lens system; first and second secondary objective lens systems arranged to provide focused images from light received from the front objective lens system; and between the front objective lens and the secondary objective lens systems a beam directing means arranged to receive light from the objective lens and to direct substantially a full aperture part of said light to each secondary objective lens system, the beam directing means being movable along the axis of the front objective lens system with respect to that lens and to the secondary objective lens systems, said movement causing equal variations in the angle subtended at the focus of the front objective lens system by the rays forming corresponding points of the respective images formed by each secondary objective lens system whereby an image having a variable degree of stereoscopy is provided.

9. A variable stereomicroscope comprising an optical system according to claim 1, and two Porro prism systems arranged



respectively to receive light from the first and second eyepiece lens systems.

4,492,442

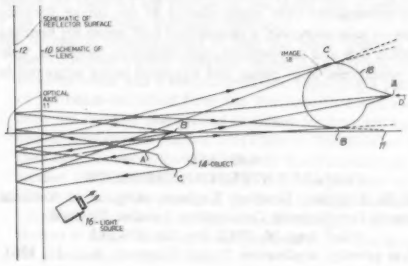
THREE DIMENSIONAL PROJECTION ARRANGEMENT

Tad J. Gaudyn, 112 Meserole Ave., Brooklyn, N.Y. 11222

Continuation-in-part of Ser. No. 082,211, Oct. 4, 1979, abandoned, which is a continuation-in-part of Ser. No. 917,400, Jun. 20, 1978, abandoned. This application Jan. 22, 1982, Ser. No. 341,613

Int. Cl.³ G03B *21/00*

U.S. Cl. 353—10 **17 Claims**



1. A three-dimensional projection arrangement for projecting a three-dimensional image of an object into space for viewing by an audience, said arrangement comprising: an object for which a three-dimensional image is projected; a light source oriented for illuminating said object; lens means comprising a multifocal refracting lens having multiple spherical zones on the side opposite from said light source, said lens being positioned to receive reflected light from said object; and

mirror means located behind said lens means away from said light source, said mirror means being adjustable relative to the lens and adapted for receiving and reflecting an image of said object from said lens means and reflecting said image back through said lens means, whereby said projection arrangement forms an enlarged three-dimensional image projected in space for viewing by an audience, the magnification of said image being adjustable by moving said mirror means relative to the lens means.

4,492,443

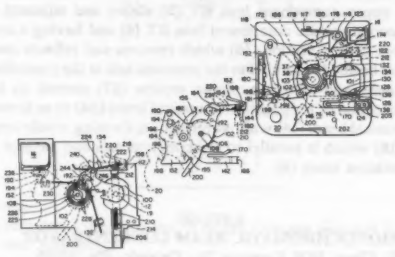
CAMERA MECHANISM

John E. Spencer, Geneseo; Reginald S. Greene, and Terrence L. Fisher, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 2, 1983, Ser. No. 500,505

Int. Cl.³ G03B *17/42*

U.S. Cl. 354—121 **14 Claims**



1. In a disk camera having a shutter, cockable and releasable shutter actuating means, film advancing means, and film locating means movable between a film locating position and a film releasing position, the improvement comprising:

a release member arranged for movement in opposite first and second directions, said release member arranged, when moved in said first direction, to first cock said shutter actuating means and to move said film locating means into said film locating position and then to release said shutter actuating means to actuate said shutter;

said release member, when moved in said second direction, arranged to move said film locating means into said film releasing position and then to actuate said film advancing means;

said shutter actuating means including a high energy member fixed at one end and having a shutter actuating portion at the opposite end; and

a cocking member operatively connected to said release member and including a cam means arranged to engage a first surface of the high energy member while cocking said shutter actuating portion and to engage the opposite surface of the high energy member after release of the shutter actuating portion.

4,492,444

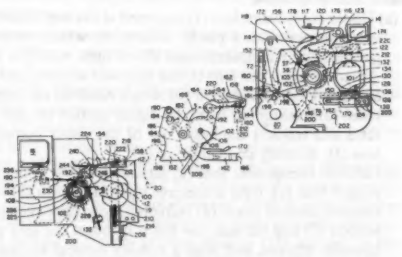
CAMERA MECHANISM

Dana W. Wolcott, Brockport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 2, 1983, Ser. No. 500,507

Int. Cl.³ G03B *17/42*

U.S. Cl. 354—121 **8 Claims**



1. In a disk camera having a shutter, cockable and releasable

shutter actuating means, film advancing means, and film locating means movable between a film locating position and a film releasing position, the improvement comprising:

a release member arranged for movement in opposite first and second directions, said release member arranged, when moved in said first direction, to first cock said shutter actuating means and to move said film locating means into said film locating position and then to release said shutter actuating means to actuate said shutter; and

said release member, when moved in said second direction, arranged to move said film locating means into said film releasing position and then to actuate said film advancing means.

4,492,445

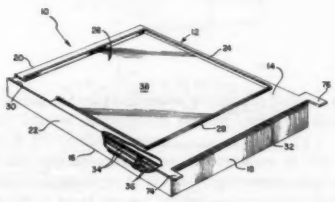
PHOTOGRAPHIC FILM ASSEMBLAGE WITH MEANS FOR ESTABLISHING A GAP BETWEEN A PAIR OF PRESSURE-APPLYING ASSEMBLIES

Philip R. Norris, North Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 8, 1982, Ser. No. 439,733

Int. Cl.³ G03B *17/26, 17/52*

U.S. Cl. 354—180 **15 Claims**



1. A film assemblage for use with a camera of the self-developing type having a pair of superposed pressure-applying assemblies at least one of which is movable relative to the other such that the adjacent spreading surfaces thereof define a gap therebetween having a predetermined minimum spacing for influencing the thickness of a layer of processing liquid to be subsequently spread between elements of an exposed film unit as it moves through the gap, said film assemblage comprising:

a film cassette having an exposure opening in one wall thereof through which a film unit is adapted to be exposed and an egress through which an exposed film unit is adapted to be moved;

a plurality of film units located within said film cassette, each said film unit comprising a container of processing liquid adjacent a leading end thereof, and a plurality of elements including a photosensitive element, said film units being arranged in a stack with said photosensitive element of an endmost film unit being located adjacent said exposure opening;

a dark slide positioned within said film cassette between said endmost film unit and said exposure opening for protecting said endmost film unit from premature exposure to ambient light during loading of said film cassette into a camera, said dark slide being adapted to be moved from said film cassette via said egress and completely through a pair of superposed pressure-applying assemblies; and

spacing means engageble with at least one of the pressure-applying assemblies and spaced from its liquid spreading surface for establishing a predetermined minimum spacing between adjacent liquid spreading surfaces of each assembly, the value of the predetermined minimum spacing being related to the desired thickness of a layer of processing liquid to be spread between elements of said film units as they are moved in engagement with and between the liquid spreading surfaces.

4,492,446

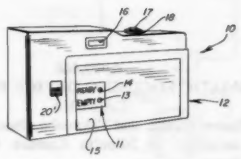
CAMERA HAVING FILM FEED INDICATOR

Arthur Zawodny, Budd Lake, and Jerzy Krysicki, Passaic, both of N.J., assignors to Keystone Camera Corporation, Clifton, N.J.

Filed Apr. 19, 1983, Ser. No. 486,397

Int. Cl.³ G03B *1/00, 17/18*

U.S. Cl. 354—215 **9 Claims**



1. In a camera including housing means defining an exposure chamber, lens means at one end of said exposure chamber, a film support at the opposite end of said exposure chamber to support the periphery of a section of film for exposure of a frame thereof, film supply spool receiving means, film take-up means for engaging a perforation of a leader of a film of a supply spool in said receiving means and for advancing said film from said supply spool to position frame sections of said film seriatim at said film support for exposure thereof, indicating means operable between a first condition indicating that film is not properly threaded and a second condition indicating that film is properly threaded and that a section of film is engaged with said film support and ready for exposure, actuating means responsive to proper initial movement of film by said film take-up means to operate said indicating means from said first condition to said second condition, said actuating means being arranged to maintain said indicating means in said second condition until after exposure of frame sections of said film, and a door movable from a closed position to an open position for access to said supply spool receiving means and said take-up means, said actuating means being arranged to operate said indicating means from said second condition to said first condition upon movement of said door from said closed position to said open position.

4,492,447

APPARATUS FOR DEVELOPING PHOTOGRAPHIC MATERIAL

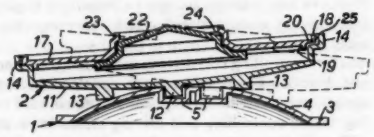
Eric Taylor, London, England, assignor to Paterson Product Ltd., London, England

Filed Sep. 28, 1982, Ser. No. 426,198

Claims priority, application United Kingdom, Oct. 2, 1981, 8129884

Int. Cl.³ G03B *3/04, 13/04*

U.S. Cl. 354—312 **5 Claims**



1. Apparatus for developing photographically sensitised material comprising: a tray for receipt of the photographically sensitised material to be processed, said tray having a raised annular foot on an underside thereof; a lid adapted to fit the tray forming a light tight processing tank, the lid having light tight means introducing processing liquid into the interior of the processing tank; and a domed base; whereby when said tray is mounted on said domed base, a point of said tray within

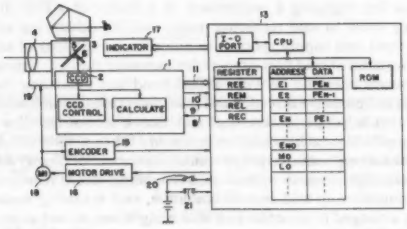
the raised annular foot is movable in a substantially circular path substantially about the central axis of said domed base with the annular foot bearing on said domed base.

4,492,448

AUTOMATIC FOCUSING DEVICE FOR USE IN A CAMERA

Norio Ishikawa, Osaka, and Takanobu Omaki, Sennan, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 431,288, Oct. 1, 1982, Pat. No. 4,445,761. This application Apr. 25, 1984, Ser. No. 603,622
Claims priority, application Japan, Oct. 2, 1981, 56-157921
Int. Cl.³ G03B 13/00
U.S. Cl. 354—406 1 Claim



1. An automatic focusing system for use in a camera comprising:

means for succesively driving an objective lens of said camera along its optical axis;

means for repeatedly detecting a focusing condition of the objective lens during the movement of the objective lens to produce a direction signal which represents a defocus direction of the objective lens with respect to a predetermined image plane, and an amount signal which represents an amount of defocus of the objective lens;

means for producing a predetermined signal which represents a predetermined amount of defocus of the objective lens;

means for comparing said amount signal with said predetermined signal to produce a comparison signal which represents the compared result;

means for monitoring the amount of axial movement of the objective lens between successive detections to produce a lens moving amount signal which represents the monitored amount; and

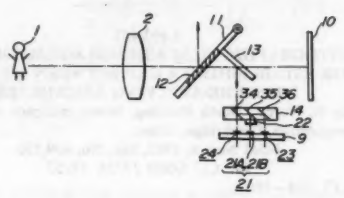
means for controlling said driving means in accordance with said direction signal, said amount signal, said comparison signal, and said lens moving amount signal, said controlling means controlling said driving means in accordance with said direction signal when said comparison signal indicates that the amount of defocus represented by said amount signal is larger than said predetermined amount of defocus represented by said predetermined signal, and said controlling means controlling said driving means in accordance with said direction signal, said amount signal and said lens moving amount signal when said comparison signal represents that the amount of defocus is smaller than said predetermined amount.

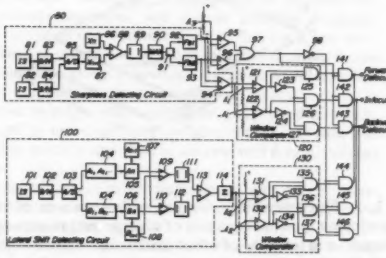
4,492,449

APPARATUS AND TECHNIQUE FOR DETECTING AND CONTROLLING THE FOCUSING OF AN OPTICAL SYSTEM BY IMAGE SHARPNESS AND LATERAL SHIFT TECHNIQUES

Kenichi Oinoue, Tokyo; Asao Hayashi, Hachioji; Junichi Nakamura, Hachioji; Masatoshi Ida, Hachioji; Masahiro Aoki, Tokyo, and Kenji Fukuoka, Fussa, all of Japan, assignors to Olympus Optical Co. Ltd., Japan

Filed May 31, 1983, Ser. No. 499,491
Claims priority, application Japan, Jun. 4, 1982, 57-95869
Int. Cl.³ G03B 7/099
U.S. Cl. 354—407 17 Claims





1. In a method for detecting a focus condition of an imaging optical system by effecting an image sharpness detection to produce a first evaluation function value S representing a sharpness of an image formed by said imaging optical system on at least two light receiving element arrays and by effecting an image lateral shift detection to produce a second evaluation function S' representing a lateral shift of two images formed on at least one light receiving element array, said two images being formed by light fluxes transmitted through different areas of the imaging optical system, the improvement comprising the steps of:

detecting the focus condition of the imaging optical system by processing said second evaluation function value S' produced by the image lateral shift detection in a first region far away from an in-focus position; and

detecting the focus condition of the imaging optical system by processing both said first and second evaluation function values S and S' in a second region near the in-focus position.

4,492,450

CAMERA WITH MICROPROCESSOR

Koji Watanabe; Kazuo Shiozawa; Kiziro Suzuki, all of Tokyo, and Ryushi Shimokawa, Takasaki, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 423,783
Claims priority, application Japan, Sep. 30, 1981, 56-156814
Int. Cl.³ G03B 7/00
U.S. Cl. 354—412 8 Claims

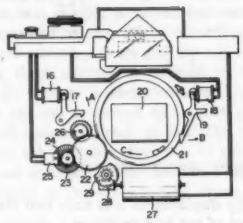
1. A method of controlling a camera having a release means

which can be operated at two stages, a microprocessor, a clock signal generating means which generates clock signals regularly, and a counter means characterized by comprising the steps of

(a) completing the arrangement for operation of the counter means according to a first stage operation of the release means,

(b) applying an output from the counter means as an interruption signal on the microprocessor when the number of clock signals from the clock signal generating means has a fixed relation with a preset value setting for the counter means,

(c) introducing selectively an information in a plurality of photographic informations to the microprocessor according to a specific program based on the interruption signal,



(d) preparing the reoperation of the counter means so as to obtain regular interruption signals based on the preset value of the counter means,

(e) introducing selectively an information in the photographic informations to the microprocessor according to the priority level thereof by next interruption signal,

(f) repeating the above steps applying an output from the counter means as an interruption signal on the microprocessor when the number of clock signals from the clock signal generating means has a fixed relation with a preset value setting for the counter means, introducing selectively an information in the photographic informations to the microprocessor according to the priority level thereof by next interruption signal, and

(g) introducing to the microprocessor photographic informations at higher priority levels many times more than that at lower priority levels.

4,492,451

ELECTRONIC FLASH UNIT

Egbertus J. P. Maassen, and Frederik J. de Jong, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

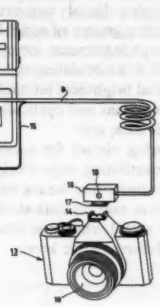
Continuation of Ser. No. 456,941, Jan. 10, 1983, abandoned. This application Jul. 5, 1984, Ser. No. 628,951

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1982, 8218380[U]

Int. Cl.³ G03B *15/05*

U.S. Cl. 354—416 **2 Claims**

1. An electron flash unit having a thin-walled housing, in which is accommodated a reflector with a discharge flash lamp and which on the light exit side is provided with a photosensitive cell, which is connected to a dosimeter for measuring a quantity of light reflected from an object to be photographed and switches off the discharge flash lamp by means of an electric circuit after measurement of an adjustable dose, of light, characterized in that the wall of the housing is provided with means for receiving an end of a light-conducting fiber cable, which end is arranged in front of the photosensitive cell, said



unit having a discrete electrically conductive wire extending from said flash unit to a connector for an associated camera.

4,492,452

PICTURE BLUR-ALARM DEVICE FOR A CAMERA

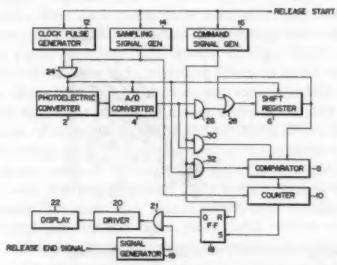
Shinichi Suzuki, Yokohama; Masayuki Sasaki, Sagamihara; Toshinori Moriyasu, Chigasaki, and Takao Arakawa, Takamatsu, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Apr. 6, 1983, Ser. No. 482,562

Claims priority, application Japan, Apr. 7, 1982, 57-57919; Apr. 7, 1982, 57-57925

Int. Cl.³ G03B *7/08*

U.S. Cl. 354—430 **16 Claims**



1. A picture-blur alarm device for a camera which device comprises:

signal generating means which is actuated in response to the shutter operation to time-sequentially generate brightness data corresponding to the brightness of at least one part of an optical image of a foreground object;

comparing means for successively comparing two brightness data which are issued at different timings from said signal generating means; and

alarm means for producing an alarm signal in accordance with the result of a comparison conducted in said comparing means,

wherein said signal-generating means comprises:

photoelectric conversion means which is provided with a plurality of photoelectric conversion elements to successively generate groups of output analog signals from said plurality of photoelectric conversion elements; and

analog-digital conversion means which converts output analog signals from said photoelectric conversion means into bit data and time-sequentially supplies said comparing means with groups of bit data corresponding to groups of

analog signals as brightness data, said photoelectric conversion means issuing in series output analog signals from said plurality of photoelectric conversion elements, and the analog-digital conversion means time-sequentially producing groups of serial bit data; and

said comparing means comprises bit data-storing means formed of a circulating type shift register for storing output serial brightness bit data from said analog-digital conversion means and cyclically supplying said serial brightness bit data; and

a comparing circuit for successively comparing serial bit data constituting output brightness data from the analog-digital conversion means with respective output serial bit data from said bit data-storing means, and producing an output signal when it is detected that both input bit data have different logic levels.

4,492,453

SINGLE LENS REFLEX CAMERA WITH MIRROR OPERATING MECHANISM

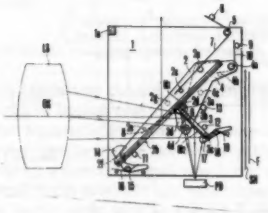
Akira Hiramatsu, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1982, Ser. No. 437,016

Claims priority, application Japan, Nov. 5, 1981, 56-177367; Nov. 5, 1981, 56-177368; Dec. 22, 1981, 56-191318[U]

Int. Cl.³ G03B *7/099*

U.S. Cl. 354—479 **8 Claims**



1. A single lens reflex camera comprising:

(a) a photographic lens system defining a photographic optical path;

(b) first mirror means constituting part of a viewfinder and having a light-permeable portion;

(c) second mirror means for receiving light passed through said light-permeable portion of said first mirror means, said second mirror means being connected to said first mirror means in pivoting relation thereto;

(d) a driving lever including an actuating portion for turning said first mirror means and said second mirror means into and from an at-rest position in said optical path;

(e) cam means engaging with said actuating portion of said driving lever, said cam means being arranged so that said second mirror means can fold on said first mirror means;

(f) first bias means for allowing said first mirror means to stay in said optical path against the force of said driving lever; and

(g) second bias means having a weaker bias force than that of said first bias means for allowing said second mirror means to stay against the force of said driving lever in a position where light passed through said light-permeable portion of said first mirror means is received.

4,492,454

REPROGRAPHY CAMERA

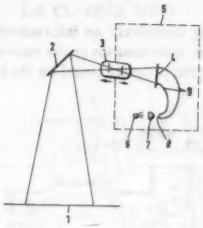
Ulrich F. Moser, Siegen, Fed. Rep. of Germany, assignor to Eurograph Gesellschaft fur Photomechanik mbH, Siegen, Fed. Rep. of Germany

Filed Dec. 13, 1982, Ser. No. 449,251

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1981, 3150433

Int. Cl.³ G03B *27/00, 27/52*

U.S. Cl. 355—1 **5 Claims**



1. A reprography camera comprising

a copy table;

a longitudinally displaceable lens such that the longitudinal displacement of the lens results in a change in the image size;

a stationary image platform having perforations;

a light source; and

light guides providing light spots positioned in the peripheral area of the image platform at the four corners of the image platform, each of the light spots being provided by a single light guide; and all of the light guides having a first end which is illuminated by a common light source, and a second end which terminates in one of the perforations in the image platform.

4,492,455

IMAGE SCANNING SYSTEM HAVING A CONTINUOUSLY ROTATING SUB-SCANNING DRUM

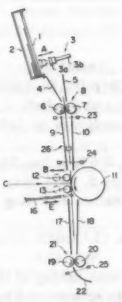
Yasuhiro Kawai, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Jul. 6, 1982, Ser. No. 395,320

Claims priority, application Japan, Jul. 6, 1981, 56-105255

Int. Cl.³ G03G *15/00*; H04N *1/22*

U.S. Cl. 355—3 R **4 Claims**



1. An image scanning system for two-dimensionally scanning a light beam across a recording sheet material comprising a sub-scanning drum adapted to be continuously rotated to feed the recording sheet material in the sub-scanning direction which is perpendicular to the rotational axis of the sub-scan-

ning drum, a main scanning system for scanning the light beam across the recording sheet material in the direction of the rotational axis of the sub-scanning drum, at least one nip roll movable between a first position in which it is pressed against the sub-scanning drum at a part near the scanning position of the light beam and a second position in which it is removed therefrom, a sheet feeding means for feeding the recording sheet material between the sub-scanning drum and the nip roll with the recording sheet material being unrestrained, a stopper which is disposed downstream of the sub-scanning drum and the nip roll with respect to the feeding path of the recording sheet material and is movable into and away from the feeding path, a sheet discharging means for discharging the recording sheet material, said sheet discharging means being arranged so as not to act on the recording sheet material to be discharged until the scanning of the recording sheet material is completed whereby when said stopper is moved into said feeding path, the said unrestrained feeding of the recording sheet material between the sub-scanning drum and the nip roll occurs until the recording sheet material is stopped by the stopper, at which time, the stopper is removed away from the feeding path and the nip roll is moved to its first position pressed against the sub-scanning drum to feed the recording sheet material in the sub-scanning direction to thereby effect the two-dimensional scanning of the light beam across the recording sheet material as the sub-scanning drum is continuously rotated.

4,492,456

DEVICE FOR DEVELOPING ELECTROSTATIC LATENT IMAGES

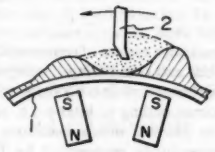
Satoshi Haneda; Masahiko Itaya, and Minoru Tanaka, all of Tokyo, Japan, assignors to Knoishiroku Photo Industry Co. Ltd., Tokyo, Japan

Filed Jul. 21, 1982, Ser. No. 400,391

Claims priority, application Japan, Jul. 31, 1981, 56-121044

Int. Cl.³ G03G *15/08*

U.S. Cl. 355;3 DD **4 Claims**



1. An electrostatic latent image developing device having a non-magnetic movable carrier member for carrying a magnetic developer from a source of supply of magnetic developer to a development area adjacent a photosensitive surface, fixed magnets installed inside said carrier member, said fixed magnets including two magnetic poles of the same polarity disposed adjacent one-another to provide two adjacent peaks of magnetic flux on the exterior of said carrier member, and a regulating member for regulating a developer layer thickness on the surface of the carrier member, said regulating member disposed over and spaced from the carrier member at a location between said source of supply and said development area and at a point between adjacent said two peaks of magnetic flux.

4,492,457

COLOR CORRECTING DEVICE FOR COLOR PRINTING LIGHT SOURCE

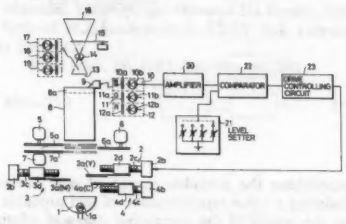
Tetsuo Kawada, Matsudo, and Yoshio Ozawa, Yokohama, both of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Jun. 1, 1982, Ser. No. 383,837

Claims priority, application Japan, Jun. 4, 1981, 56-86004

Int. Cl.³ G03B *27/80*

U.S. Cl. 355—38 **2 Claims**



1. In a color correcting device for a printing light source in a color printer comprising light adjusting filters provided insertably in a light path of a light from said light source for adjusting the amount and the color temperature of the light from said light source so as to adapt the light from said light source for a printing exposing light, and exposing filters for determining an exposure amount of said printing exposing light on a negative film, an improvement comprises light receiving means arranged to receive a part of the printing light leading to a printing paper from the light source, driving means respectively connected to the light adjusting filters to insert said light adjusting filters into said light path, and servo-systems including therein said light receiving means and said driving means, the amounts of insertion of said light adjusting filters into said light path being adjusted through said servo-systems by comparing values obtained through said light receiving means by receiving said printing exposure light before passing through said negative film under the state in which said exposing filters are retracted out of the light path, with values obtained through said light receiving means by receiving said printing exposure light passed through a standard negative film set in the light path.

4,492,458

METHOD OF AND ARRANGEMENT FOR COPYING A COLORED ORIGINAL

Horst Bickl, Pullach; Günter Findeis, Sauerlach, and Helmut Treiber, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,500

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1981, 3151939

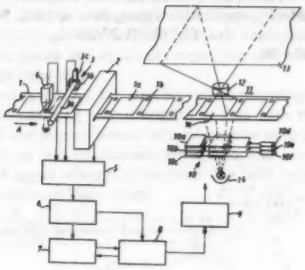
Int. Cl.³ G03B *27/80*

U.S. Cl. 355—38 **40 Claims**

1. A method of copying a colored original comprising the steps of:

(a) deriving a first magnitude and a plurality of second magnitudes for at least one color-dependent parameter of said colored original by sensing selected regions of the latter, said first magnitude being characteristic of at least the major part of said colored original and said second magnitudes respectively being characteristic of said selected regions;

(b) determining the deviation of said first magnitude form a reference magnitude for said one parameter;
(c) comparing said first magnitude with said second magnitudes when said deviation exceeds a predetermined amount;



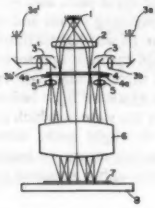
(d) establishing the probable source of said deviation by calculating a value representative of said probable source from the results of the comparing step and relating said respresentative value to a reference value; and
(e) copying said colored original under conditions depending upon said probable source.

4,492,459

PROJECTION PRINTING APPARATUS FOR PRINTING A PHOTOMASK

Takashi Omata, Yokosuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 229,932, Jan. 30, 1981, abandoned. This application Jan. 18, 1983, Ser. No. 458,949
Claims priority, application Japan, Feb. 6, 1980, 55-13254
Int. Cl.³ G03B *27/52*; G01B *11/26*
U.S. Cl. 355—43 **6 Claims**



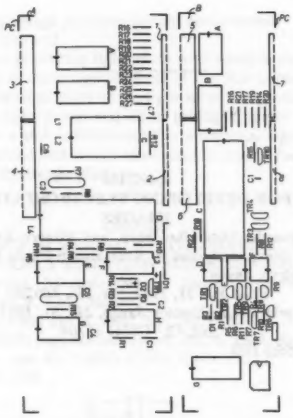
1. Projection printing apparatus for printing images carried on a photomask onto a wafer alignable with the photomask, comprising:
photomask supporting means for supporting a photomask having a circuit pattern image and an alignment pattern image thereon;
wafer supporting means for supporting a wafer for receiving a circuit pattern image and an alignment pattern image projected thereto;
an image projection optical system having an image field sufficiently large to project both the circuit pattern image and the alignment pattern image from the photomask to the wafer;
light source means for illuminating the photomask with non-sensitizing light during alignment of the photomask and wafer and for illuminating the photomask with sensitizing light during printing of the wafer with the images; and
an alignment pattern imaging system, cooperating with the image projection optical system, to form on the wafer the alignment image of the photomask illuminated by the non-sensitizing light.

4,492,460

METHOD OF MAKING REPRESENTATIONS OF, AND METHOD OF AND MEANS FOR MAKING, PRINTED CIRCUIT BOARDS

William H. Considine, Haymans Ghyll, Coolham, Nr. Horsham, Sussex, England

PCT No. PCT/GB81/00134, § 371 Date Mar. 1, 1982, § 102(e) Date Mar. 1, 1982, PCT Pub. No. WO82/00398, PCT Pub. Date Feb. 4, 1982
PCT Filed Jul. 8, 1981, Ser. No. 359,659
Claims priority, application United Kingdom, Jul. 10, 1980, 8022667
Int. Cl.³ G03B *27/02*
U.S. Cl. 355—133 **22 Claims**

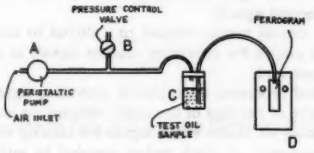


1. A method of making a system of representations of printed circuit board sections and comprising the steps of forming at least two printed circuit board (p.c.b.) section representations having portions corresponding to inter-p.c.b. section connections which are to provide interconnections between two circuit portions respectively represented by the representations, arranging each p.c.b. section to correspond to a respective one of a plurality of functional modules comprising apparatus based on the complete circuit and arranging the corresponding inter-p.c.b. section connection portions of each of the representations in predetermined positions such that visually continuous interconnections can be formed between the circuit portions when the representations are caused to provide a visual pattern of the complete circuit represented by the combined representations, at least one of the representations, being of a first functional module, being capable of being substituted by a representation of a second functional module different from the first functional module while still maintaining the visual continuity of the necessary inter-p.c.b. section interconnections with the representations immediately adjoining the substituted representation.

4,492,461
WEAR ANALYSIS EQUIPMENT

David G. Jones, P.O. Box 9531, Dharan, Saudi Arabia, and Oh K. Kwon, KIST Labs., P.O. Box 131, Dongdaemum, Seoul, Rep. of Korea

Filed Mar. 12, 1982, Ser. No. 357,553
Claims priority, application United Kingdom, Mar. 19, 1981, 8108695
Int. Cl.³ G01N *33/28*
U.S. Cl. 356—38 3 Claims



1. A method of analyzing magnetically polarisable wear particles carried in a liquid medium, comprising the steps of:

passing the liquid medium with its wear particles carried therein from a reservoir thereof through a length of a tube to an outlet end thereof;

impinging a flow from the outlet end onto an entry point on a upper surface of a substrate located in a magnetic force field having a component extending generally at right angles to the upper surface for attracting the particles thereonto, the liquid medium with its wear particles carried therein being fed to the entry point on the substrate via said length of the tube by applying pressure to the reservoir of the liquid medium with its wear particles without subjecting any region of said length of the tube to fluctuating lateral compressions;

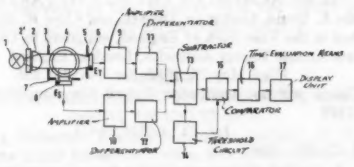
allowing the medium to flow from the entry point across the upper surface while the force field precipitates the particles in any array on the upper surface at varying distances from the entry point depending on the nature of the wear particles; and

optically monitoring the array of precipitated particles.

4,492,462
PHOTOMETRIC METHOD FOR DETERMINING COURSES OF REACTIONS

Wilhelm Prass, Oberstdorfer Str. 8, 8000 München 71; Jürgen Barry, Ludmillastr. 13, 8000 München 90; Franz Mühlböck, Gabriele-Münter Str. 9, 8000 München 71, and Klaus Hartmann, Südliche Auffahrtsallee 68, 8000 München 19, all of Fed. Rep. of Germany

Filed Feb. 13, 1981, Ser. No. 234,573
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1980, 3005923
Int. Cl.³ G01N *33/48*
U.S. Cl. 356—39 8 Claims



1. A photometric method for determining the coagulation time of a sample, said sample including blood mixed with a reagent, comprising:

detecting the intensity of a light beam transmitted through said sample and forming an electrical signal proportional thereto;

detecting, at an angle of from 90 to 180 degrees to the transmitted light beam, the intensity of light scattered by said sample and forming an electrical signal proportional thereto;

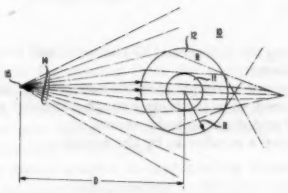
combining said electrical signals to form a combined signal;

from said combined signal, determining the coagulation time of said sample.

4,492,463
METHOD FOR INSPECTING MULTILAYER TRANSPARENT RODS

Dietrich Marcuse, Lincroft, and Herman M. Presby, Highland Park, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 29, 1982, Ser. No. 362,961
Int. Cl.³ G01N *21/88*
U.S. Cl. 356—73.1 4 Claims



1. A method for fabricating an optical fiber, comprising the steps of:

forming an optical fiber which includes a longitudinal axis and a surface;

impinging at least a characteristic region of said fiber with electromagnetic radiation while said region is immersed in a fluid medium, said fluid medium and said region being at least partially transparent to said radiation, and the index of refraction of said fluid medium being different from that of said region;

detecting electromagnetic radiation emanating from said region; and

accepting the whole of said fiber if the structure of said region, as determined from the detected radiation, conforms to a desired standard,

characterized in that

at least a portion of said impinging electromagnetic radiation is a diverging beam of light lying in a plane transverse to said longitudinal axis, said beam undergoing refraction at said surface, and the divergence of the beam being chosen so that after said refraction, at least a portion of the beam is substantially collimated.

4,492,464
APPARATUS AND METHOD FOR DISTANCE MEASUREMENT BY LASER INTERFEROMETRY

Gilbert L. Bourdet, Bures sur Yvette, and Michel A. Franco, Paris, both of France, assignors to Agence Nationale de Valorisation de la Recherche, Paris, France

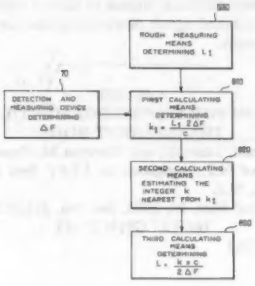
Continuation-in-part of Ser. No. 197,905, Oct. 17, 1980, abandoned. This application Mar. 27, 1984, Ser. No. 593,927
Claims priority, application France, Oct. 17, 1979, 79 25771
Int. Cl.³ G01C *3/00*
U.S. Cl. 356—4.5 10 Claims

1. A process for precisely measuring distances comprising the steps of:

arranging two spaced plates of an interferometer at a distance apart denoted L which is the distance to be measured,

applying to the plates two beams of radiation of differing frequencies from respective single frequency lasers,

adjusting the frequencies of the lasers independently of one another so that they correspond to two different longitudinal modes of the interferometer, respectively,


ROUGH MEASURING MEANS DETERMINING L_1
DETECTION AND MEASURING DEVICE DETERMINING ΔF
FIRST CALCULATING MEANS DETERMINING $k_1 = \frac{L_1 \times 2\Delta F}{c}$
SECOND CALCULATING MEANS ESTIMATING THE INTEGER k NEAREST FROM k_1
THIRD CALCULATING MEANS DETERMINING $L = \frac{k \times c}{2\Delta F}$

measuring the difference (ΔF) between said frequencies after adjustment,

carrying out a rough measurement of the distance to be measured, so as to obtain a rough estimated value denoted L_1 of said distance to be measured,

calculating a number k_1 by the equation:

$$k_1 = \frac{L_1 \times 2\,\Delta F}{c}$$

where c is the speed of light in the interferometer,

determining an integer k which is the nearest integer to k_1, and then

calculating the distance (L) between the two plates of the interferometer by the equation:

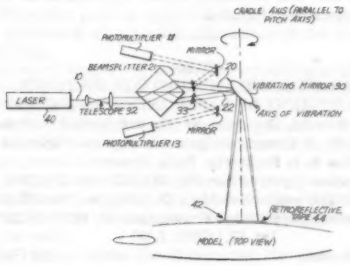
$$L = \frac{kc}{2\,\Delta F}$$

4,492,465

RETRO-REFLECTIVE ELECTRO-OPTICAL ANGLE MEASURING SYSTEM

Joachim C. Erdmann, Seattle, Wash., and Robert I. Gellert, Quesnel, Canada, assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 18, 1980, Ser. No. 217,733
Int. Cl.³ G01B *11/26*; G01C *21/06*
U.S. Cl. 356—152 **11 Claims**



1. A signal processor for reading out the time differences between two pulses which arise sequentially providing first and second signals when a first beam and then a second beam are incident upon a retro-reflective tape during a half period of a sweep cycle, said signal processor comprising:

a function generator for generating a triangular waveshape signal utilized to drive a vibrating mirror;

signal generating means for blanking the retro-reflective signal during a half period of said sweep cycle;

high frequency clock signal generating means for providing a sequence of clock pulses;

a signal processor logic circuit;

signal shaping means coupled to said signal processor logic circuit, said signal shaping means responsive to said first and second signals;

counter circuit means coupled to a digital to analog converter circuit for providing readout signals at an output terminal; and,

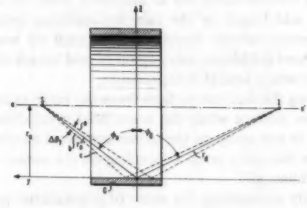
said signal processor logic circuit providing signals representative of the sign of the angle information and further providing an enable status signal for turning on and off said sequence of clock pulses coupled to said counter circuit means.

4,492,466

CYLINDRICAL GRATING MONOCHROMATOR FOR SYNCHROTRON RADIATION

David E. Aspnes, Watchung, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 28, 1982, Ser. No. 393,078
Int. Cl.³ G01J *3/18*
U.S. Cl. 356—334 **5 Claims**



1. A monochromator comprising a grating, said grating having a plurality of grooves with variable groove spacing, d, and entrance and exit slits, said grating being rotationally symmetric about an axis between said entrance slit and said exit slit whereby the diffraction into the exit slit occurs at the same wavelength for each ray incident on said grating from said entrance, said variable groove spacing is approximately of the form $d = d_o \exp(-ay)$ where d_o is the separation between the grooves at y_o, a is a constant, and y is the coordinate parallel to said symmetry axis.

4,492,467

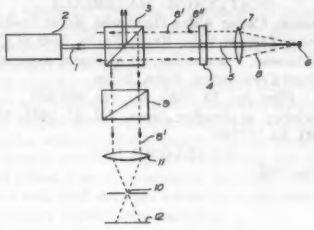
MEASUREMENT OF THE SIZE OF PARTICLES

Leslie E. Drain, Goring on Thames, and Clive R. Negus, Stanford in the Vale, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed May 25, 1982, Ser. No. 381,855
Claims priority, application United Kingdom, Jun. 4, 1981, 8117190
Int. Cl.³ G01N *15/02*
U.S. Cl. 356—336 **4 Claims**

1. A method of determining the size of spherical particles, comprising the operations of illuminating a volume of space including spherical particles, the size of which is to be measured, with circularly polarized light having a given direction of rotation of its electric vector, detecting circularly polarized light backscattered from the particles and having the direction

of rotation of its electric vector opposite to that of the incident light, measuring the angular distribution of the intensity of the



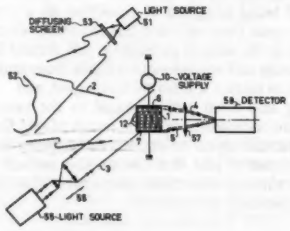
said backscattered light, and deriving therefrom the size of the particles.

4,492,468

INTERFEROMETER FOR THE REAL TIME DISPLAY OF DEFORMATIONS OF VIBRATING STRUCTURES

Jean-Pierre Huignard; Jean-Pierre Herriau, and Abdellatif Marrakchi El Fellah, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 16, 1981, Ser. No. 321,701
Claims priority, application France, Nov. 25, 1980, 80 24966
Int. Cl.³ G01B 9/029
U.S. Cl. 356—347 **10 Claims**



1. An interferometer for the real time display of deformations of a vibrating structure comprising:

means for producing coherent radiation and directing said radiation onto said vibrating structure

photosensitive electrooptical recording material for receiving coherent reference radiation and object radiation beams diffused by thesaid vibrating structure to record in volume and in real time, to within a time constant characteristic of the material, an interferomatic hologram constituted by a fixed system of index layers corresponding to the deformation of said vibrating structure and

means for reading and displaying the interferomatic hologram recorded in said material from the object beam directly emerging from the recording material.

4,492,469

SYSTEM FOR MEASURING THE PRESSURE SEALED INSIDE AN ENVELOPE

Yasutomo Fujimori, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 5, 1982, Ser. No. 375,225
Claims priority, application Japan, May 20, 1981, 56-74850
Int. Cl.³ G01B 9/02
U.S. Cl. 356—361 **7 Claims**

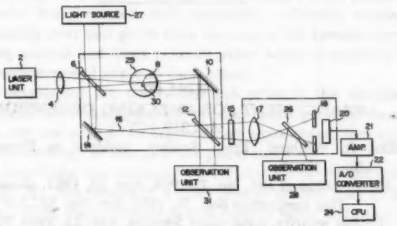
1. A system for measuring a pressure of a gas contained in a lamp having a heat source in the form of a filament comprising:

emitting means for emitting a coherent light beam;

splitting means for splitting the coherent light beam into a first and second light beam;

means for conversion at least said first light beam towards a conversion point;

means for subjecting to interference said first light beam diverse from said conversion point and said second light beam, and for producing light containing information of the interference fringes;



reading means for reading from the received interferred light a change a number of order of interference which is caused by interference during a predetermined period of time after said filament of said lamp arranged near said conversion point is energized;

calculating means coupled to said reading means for performing an operation according to the relationship of:

$$P \cong \frac{m\lambda}{\eta(n_o - 1)} \cdot P_o$$

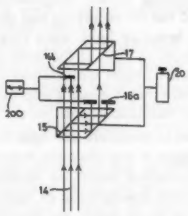
where m is the order of interference change which is not limited to an integer, λ is a wavelength of a coherent light beam, l is an inner diameter of said lamp, n_0 is a refractive index of said gas at ambient pressure p_0 and η is a proportional constant.

4,492,470

MEASURING MICROSCOPE

Francis H. Smith, York, England, assignor to Vickers Limited, London, England

Continuation-in-part of Ser. No. 060,868, Jul. 26, 1979, abandoned. This application Mar. 1, 1982, Ser. No. 353,207
Claims priority, application United Kingdom, Jul. 26, 1978, 31185/78; Dec. 20, 1978, 49229/78
Int. Cl.³ G01B 11/00
U.S. Cl. 356—372 **12 Claims**



1. A measuring microscope, for measuring the distance between line elements of an optical image, the microscope comprising:

amplitude dividing means arranged to receive an image-carrying beam, bearing only the said optical image, and to provide therefrom mutually shearable image beams;

suppression means arranged in the paths of the shearable image beams to suppress respective complementary regions of the shearable image beams, to form respective non-overlapping but adjacent image portions for viewing; and

adjustment means for carrying out calibrated displacement of the image portions relative to one another.

4,492,471

ARRANGEMENT FOR CHECKING DIMENSIONAL ACCURACY

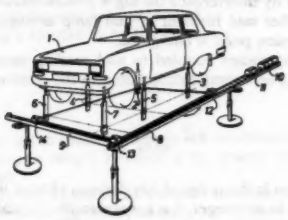
Klas R. Wiklund, Taby, Sweden, assignor to Pharos AB, Lidingo, Sweden

Continuation of Ser. No. 256,908, Apr. 23, 1981, abandoned. This application Sep. 30, 1983, Ser. No. 537,329

Claims priority, application Sweden, Apr. 23, 1980, 8003081

Int. Cl.³ G01B *11/14*; G01C *3/02*; G02B *5/12*; G02F *1/19*

U.S. Cl. 356—375 **9 Claims**



1. A dimensional checking apparatus for checking the dimensions of large, heavy, elongate objects such as automobile bodies, each object being provided with a plurality of checking points spaced along the length and width thereof and being mounted on a device such as a jig or alignment bench, the apparatus comprising:

a plurality of graduated rulers, each ruler mountable at a corresponding checking point;

at least one measuring guide bar having a length that is at least substantially the length of the object;

means for positioning said at least one guide bar parallel to the longitudinal axis of said object;

a source of a visible light beam fixedly mounted to said bar, said source emitting said light beam parallel to said bar;

at least two directing means longitudinally, adjustably mounted on said bar for receiving and directing at least a portion of said beam of light, each directing means for directing said beam of light at the same selectable one of said rulers at known angles with respect to said guide bar, but from different points on said guide bar, each directing means having an indicatable position on said guide bar;

a modulating means to modulate said light beams with mutually different phases at a modulation frequency, said modulating means including means for causing each beam to abruptly commence transmission of light toward the object at the start of its on phase, and for causing said beam to remain on during its on phase, and for abruptly stopping light transmission at the commencement of its off phase, and for causing said beam to remain off during its off phase, wherein, light incident upon a point from only one light beam is seen to be flickering, while a steady light is seen if that point has more than one light beam incident thereon.

4,492,472

METHOD AND SYSTEM FOR DETERMINING SHAPE IN PLANE TO BE DETERMINED IN ATMOSPHERE OF SCATTERING MATERIALS

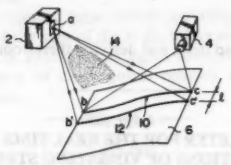
Yuichiro Asano. Chiba; Akira Hirahashi, Kobe; Suehisa Ohga, Takarazuka; Tadashi Yabe; Kunio Kurita, both of Chiba, and Atsushi Momose, Takarazuka, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Jul. 19, 1982, Ser. No. 399,847

Claims priority, application Japan, Jul. 27, 1981, 56-117247; Jul. 27, 1981, 56-117249

Int. Cl.³ C21B *7/24*

U.S. Cl. 356—376 **8 Claims**



1. A method for determining the shape of a surface to be determined in an atmosphere of scattering materials comprising:

irradiating light on a first line to be determined being imagined on said surface to be determined in the atmosphere of scattering materials to extract a first picture signal at the time of picking up said first line;

irradiating light on a second line on said surface to be determined being imagined at a position on a prescribed distance apart from said first line to extract a second picture signal at the time of picking up said second line;

substracting said second picture signal from said first picture signal to extract a fresh picture signal; and

applying said fresh picture signal to the two-dimensional position coordinates of a first image of said first line in the first picture signal to extract three-dimensional position coordinates of said first line on said surface to be determined through coordinate conversion of said two-dimensional position coordinates.

4,492,473

OPTICAL MICROMETER

Bruno Richter, Stegaurach, and Bernhard Brand, Niederwerrn, both of Fed. Rep. of Germany, assignors to Bruno Richter GmbH, Stegaurach, Fed. Rep. of Germany

Filed Nov. 1, 1979, Ser. No. 90,331

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1978, 2849252

Int. Cl.³ G01B *11/02, 11/08, 11/10*

U.S. Cl. 356—386 **6 Claims**

1. An opto-electronic measuring device for measuring the position or dimensions of an object for use with a light source which emits a highly coherent light beam, said measuring device comprising:

a motor having a rotating drive shaft;

a single or multifaced rotating mirror mounted on said shaft for rotation by said motor;

a deflecting mirror positioned to reflect said light beam from said light source to said rotating mirror to produce a scanning plane of light;

a collimating means to bend light in said scanning plane into parallel beams directed at an object to be measured, said object interrupting a portion of said parallel beams;

a first light receiver for receiving non-interrupted parallel light beams and generating a signal corresponding to the position of said interrupted portion of parallel beams;

a focusing means to direct non-interrupted light to said first light receiver;

a voltage controlled oscillator for producing pulses of a controlled frequency;

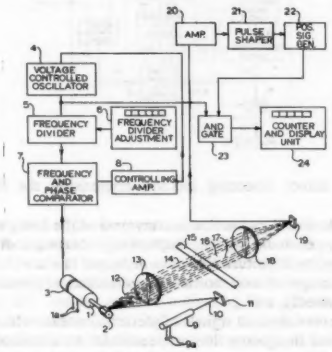
a means for generating and displaying a position signal derived from said signal from said first light receiver including a means for counting the number of pulses from said oscillator which occur during each interruption, said position signal representing the position or dimension of the object to be measured;

a shaft encoder mounted on said drive shaft for corotation with said rotating mirror for generating a pulse signal at a first output having a pulse frequency proportional to the angular velocity of said motor and said rotating mirror;

a frequency control loop for controlling the frequency of said pulses from said oscillator for which the pulse signal from said shaft encoder serves as a reference signal, said frequency control loop including

a frequency divider for receiving the output of said voltage controlled oscillator, and

a phase and frequency comparator connected to said frequency divider and said shaft encoder for comparing



the respective frequencies thereof and for generating an error signal corresponding to a difference between said frequencies, said comparator being connected to said voltage controlled oscillator for supplying said error signal thereto so that the oscillator output is continuously synchronized with the angular velocity of said rotating mirror;

a frequency divider adjustment circuit connected to said frequency divider for selectively changing the dividing ratio of said frequency divider;

a counter to which pulses from said shaft encoder are supplied;

a means for generating a reset signal to set said counter, said reset signal corresponding to at least one specific position of said drive shaft; and

an addressable memory connected to said counter with the contents of said counter determining a memory output, said memory output being conducted to said frequency divider adjustment circuit for automatically operating the frequency divider adjustment circuit to change the dividing ratio.

4,492,474

METHOD AND APPARATUS FOR ASCERTAINING COLOR BALANCE OF PHOTOGRAPHIC PRINTING PAPER

Bertram W. Miller, Apartado Postal 316, Chapala, Jalisco 45900, Mexico

Filed May 26, 1982, Ser. No. 382,030
Int. Cl.³ G01J 3/46
U.S. Cl. 356—404 **11 Claims**

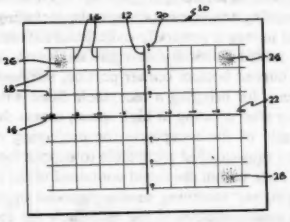
1. A method for ascertaining the color balance of color photographic printing paper of the type having three superimposed light-sensitive emulsion layers, each of which is selectively responsive to a different primary color of light, comprising the steps:

(a) photographing a target-card on each roll of color film from which it is desired to make positive color prints, under conditions common to other exposures made on the same roll of film, said target-card having three primary colors printed thereon, a first primary color being printed in essentially uniform density over a given area, a second primary color being printed with essentially a linearly varying density over said given area and a third primary color being printed with essentially a linearly varying density over said given area, the axes of the linearly varying second and third primary color being disposed at a predetermined angle to each other;

(b) developing the color film and printing the resulting negative or transparency on the color printing paper under test with an enlarger having a colorhead filter unit;

(c) processing the exposed test print; and

(d) identifying the estimated overall density of the test print and the coordinates of a small area of neutral gray in the test print, the estimated overall density being indicative of needed correction for overall density in subsequent prints and the coordinates being indicative of the measure of



required filtration changes at the enlarger colorhead to produce balanced color in subsequent prints made on the same lot of color printing paper from the same roll of negatives or transparencies.

5. A target-card for use in ascertaining the color balance of photographic printing paper, said card having:

(a) a layer of a color of uniform density, said color being one of the primary colors;

(b) a coincident layer of a different primary color whose density varies linearly with distance horizontally across the card, said density being a logarithmic function;

(c) a coincident layer of a third primary color whose density varies linearly with distance vertically across the card; and

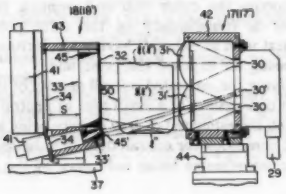
(d) a grid coincident with the aforementioned colors, said grid composed of horizontal and vertical lines, the major axes of said grid crossing at the center of the grid, the pigments of said primary colors being selected such that a net color of neutral gray is found at said center, the intersection of each grid line with a major axis being marked with a filtration correction composed of a signed number, the spacings of the grid lines and the marked corrections being preselected based upon the gamma of an average sample of the film to be used.

4,492,475

METHOD OF DETECTING FOREIGN MATTERS MIXED IN A LIQUID CONTAINED IN TRANSPARENT RECEPTACLES AND APPARATUS RELEVANT THERETO

Toshio Takahashi, Honjo, Japan, assignor to Eisai Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 353,794
Int. Cl.³ G01N 21/90
U.S. Cl. 356—427 4 Claims



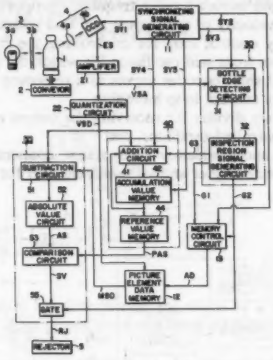
1. An apparatus for detecting foreign matters mixed in liquid in an upstanding transparent receptacle, including receptacles of the kind having a generally cylindrical sidewall and a bottom wall joined generally at right angles to said sidewall through a curved bottom corner portion, said apparatus comprising means for bringing a receptacle filled with liquid to a sudden stop after rotating at high speed, means disposed adjacent one side of the receptacle for projecting rays of light through the thus-stopped receptacle to expose foreign matters in floating state within the liquid contained in the receptacle to rays of light, ray receiving means disposed opposite to said projecting means relative to the receptacle for receiving rays of light transmitted through the receptacle, and means for detecting foreign matters mixed in the liquid by sensing the decrease in the amount of rays received by the ray receiving means, said projecting means comprising a first projecting head disposed in the upper part of said projecting means for projecting rays of light along a first optic axis through the upper portion of the receptacle at a first angle thereto which is almost a right angle and a second projecting head disposed in the lower part of said projecting means, said ray receiving means comprising first and second receivers each including a ray receiving surface and a corresponding ray focusing lens aligned therewith, each focusing lens being composed of a bundle of a multiplicity of light focusing glass fibers arranged in parallel with the optic axis of such lens, said second projecting head being aimed divergently from said first projecting head to project rays of light aslant downward through the lower portion of the receptacle along an optic axis at a second angle thereto and diverging from said first optic axis, said downward aslant optic axis of said second projecting head passing through the curved bottom corner portion of the receptacle at the circumferential segment thereof furthest from said second projecting head and closest to said second receiver for illuminating such curved bottom corner portion, said focusing lens and the ray receiving surface of said first and second receivers being aligned along different directions so as to respectively face generally horizontally toward the first projecting head and upward aslant toward the outside of said circumferential segment of said curved bottom portion of said receptacle.

4,492,476

DEFECT DETECTING METHOD AND APPARATUS

Takashi Miyazawa, Funabashi, Japan, assignor to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1982, Ser. No. 347,745
Claims priority, application Japan, Feb. 20, 1981, 56-23895; Feb. 2, 1982, 57-15395
Int. Cl.³ G01N 21/90
U.S. Cl. 356—428 27 Claims



1. A defect detecting method comprising the following steps:

a bottle under inspection is conveyed while being spun,

picture element signals respectively corresponding to a plurality of picture elements, arranged in a matrix form, of an image of said bottle are generated sequentially and repeatedly, and

the picture element signals of picture elements which are on a same imaginary line perpendicular to a central axis of said image are sequentially subjected to comparison to detect a defect in said bottle,

wherein the picture element signal of one picture element is compared with the picture element signal of another picture element that is symmetrical with respect to the central axis of said image to detect a defect in said bottle,

the central axis being an axis parallel to an axis about which the bottle is spun.

4,492,477

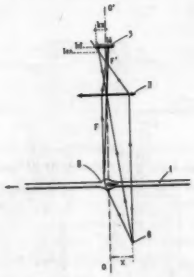
PROCESS AND APPARATUS FOR THE DETECTION OF FLAWS IN TRANSPARENT SHEETS OF GLASS

Jacques F. Leser, Montpellier, France, assignor to CEM Cie Electro-Mecanique, Paris, France

Filed Feb. 17, 1982, Ser. No. 349,621
Claims priority, application France, Feb. 25, 1981, 81 04139
Int. Cl.³ G01N 21/89
U.S. Cl. 356—430 14 Claims

3. An apparatus for permitting the examination of transparent sheets for detecting flaws in a sheet and for discriminating between the flaws and opaque foreign bodies deposited on the transparent sheet, comprising means for moving the sheets, a light source located below the transparent sheet to be checked, said light source being thin and linear and arranged at a 45° angle in relation to the direction of movement of the sheet, said light source being parallel to the horizontal plane of said sheet and being parallel to a vertical plane containing an optical axis of a convergent optical system and a linear network of photodiodes which constitute a receiving organ for the light from the light source, said light source being located at a distance (x) relative to the vertical plane such that the linear network is externally tangent to a fringe of a fuzzy real image produced by the optical system in a plane of the network of photodiodes, the lengths and positions of the light source and of the network

of photodiodes being such that the fuzzy real image which the optical system produces of the light source in the plane of the network, covers the length of this network whereby sweeping of the whole of the surface of the sheet is accomplished without any moving mechanical element interposed between the light source and the network of photodiodes, adjustment means for maintaining constant both the distance (x) at which the light source is located from the vertical plane containing both the optical axis of convergent optical system and the linear network of photodiodes and the parallelism of the light source with the vertical plane such that the optical gain will always be optimal over the whole length of the linear network in spite of the variations in either the nature of the transparent sheet to be checked or dimensional variations of a chassis of the



apparatus, said adjustment means includes a plate for mounting the linear network of photodiodes, said plate being provided with two toothed circular sectors diametrically opposed on each side of the network and a worm screw associated with each of the circular sectors activating the circular sectors either simultaneously or individually at equal or different speeds and in the same direction or in opposite directions, said worm screws being driven by two motors step by step controlled independently from each other in response to the amount of light received by each one of photodiodes, whereby the network can be moved automatically either in a direction parallel to itself or at an angle and the network may be subjected to two simultaneous movements so as to be moved on the resultant of the movement to a desired value (kx), K being the coefficient of reduction of the optical system.

4,492,478

METHOD AND APPARATUS FOR APPLYING MORTAR OR CONCRETE

Yasuro Ito, 38-16, Numabukuro 4-chome, Nakano-ku, Japan; Yoshiro Higuchi, Tokyo; Masanori Tsuji, Osaka; Yasuhiro Yamamoto, Kawasaki; Hiroshi Tada, Saitu; Kenji Kuroha, Tokyo; Takashi Nakamura, Hasuda, and Koichi Tomikawa, Yokohama, all of Japan, assignors to Yasuro Ito and Taisei Corporation, both of Tokyo, Japan

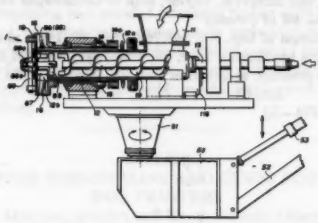
Filed Apr. 29, 1982, Ser. No. 372,950

Claims priority, application Japan, Sep. 18, 1981, 56-146065; Jan. 22, 1982, 57-6340[U]; Jan. 27, 1982, 57-10205; Jan. 27, 1982, 57-8682[U]; Jan. 27, 1982, 57-8683[U]

Int. Cl.³ B28C *5/38*

U.S. Cl. 366—28 **11 Claims**

1. Apparatus for projecting mortar or concrete comprising:
a first material supply pipe for conveying under pressure said first material, one of ingredients of said mortar or concrete;
a hopper charged with second material, the other ingredient of said mortar or concrete;
a second material supply pipe connected to said hopper;
a rotary screw disposed in said second material supply pipe for mechanically conveying said second material supplied from said hopper; and
a rotary disc for admixing said first and second materials conveyed through said first and second material supply pipes to project a resulting mixture;



said first and second material supply pipes and said rotary disc being arranged coaxially and said first and second material supply pipes being arranged concentrically.

4,492,479

SMALL ELECTRONIC TIMERS

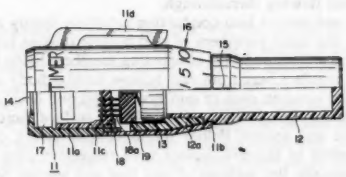
Toshikazu Hatsuse, Tanashi, and Kazunari Kume, Tokorozawa, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1983, Ser. No. 489,266

Claims priority, application Japan, May 7, 1982, 57-76181; May 14, 1982, 57-70266[U]

Int. Cl.³ G04F *8/00*; G04C *21/16*

U.S. Cl. 368—109 **10 Claims**



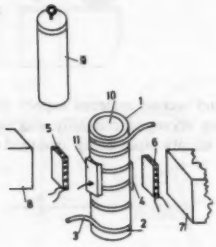
1. A small electronic timer comprising:
(1) a circuit arrangement including;
(a) a standard frequency oscillator,
(b) a frequency divider,
(c) a time unit pulse generating circuit for generating a time unit pulse in response to an output signal of said frequency divider,
(d) a time counter for counting said time unit pulse,
(e) a data memory circuit,
(f) a coincidence detecting circuit for comparing data stored in said data memory circuit and data of said time counter and producing a coincidence signal, and
(g) a control circuit operated by said coincidence signal,
(2) a battery for supplying power to said circuit arrangement;
(3) a sound emitting means driven by said control circuit;
(4) a time setting means for feeding a set time to said data memory circuit; and
(5) a first housing and a second housing for accommodating said circuit arrangement, battery, sound emitting means and time setting means, said first and second housings permitting their relative position to be changed;
(6) whereby, by changing the relative position of said first and second housings, said time setting means is operated and said timer is set.

4,492,480

PROBE FOR USE IN A MICROCALORIMETER

Ingemar Wadsö, Blickhornsvägen 6, S-222 67 Lund; Jaak Suurkuusk, and Robert L. Taylor, both of Gränsvägen 21, S-175 46 Järfälla, all of Sweden

Continuation of Ser. No. 349,768, Feb. 18, 1982, abandoned. This application Mar. 28, 1984, Ser. No. 594,414
Claims priority, application Sweden, Feb. 26, 1981, 8101245
Int. Cl.³ G01K *17/00*; G01N *25/20*
U.S. Cl. 374—33 3 Claims



1. A device for use in a microcalorimeter, comprising a hollow tubular body adapted to receive an article which contains at least one material to be thermally tested therein; said hollow tubular body being further adapted to conduct heat generated by the article received therein;

a fluid conduit adapted to conduct heat;

said hollow tubular body having a continuous helical groove about its periphery, said helical groove being adapted to receive said fluid conduit therein;

said fluid conduit being adapted to receive a heat-generating fluid flowing therethrough;

first and second heat-conducting members fixedly attached to the outer periphery of said hollow tubular body, and first and second heat-conducting members being adapted to conduct heat from said hollow tubular body and said fluid conduit; each of said first and second heat-conducting members having a generally flat surface thereon;

a first and second Peltier thermocouple having one side thereof in thermal contact with respective ones of said generally flat surfaces of said first and second heat-conducting members;

said first and second Peltier thermocouples each having another side in thermal contact with a heat sink, each said heat sink having sufficient heat capacity so as to be adapted to remain at a substantially constant temperature while heat is being conducted across said first and second Peltier thermocouples;

heat generated within said hollow tubular body and said fluid conduit being conducted to said heat sinks;

whereby heat generated within said hollow tubular body and said fluid conduit, passing across said first and second heat-conducting members and passing across said first and second Peltier thermocouples, is measureable by said first and second Peltier thermocouples.

4,492,481

THRUST BEARING STARTER APPARATUS

David J. Shore, Clarence, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 28, 1982, Ser. No. 437,373
Int. Cl.³ F16C *17/10, 19/50, 21/00, 39/04*
U.S. Cl. 384—228 1 Claim

1. A vertical axis machine comprising:

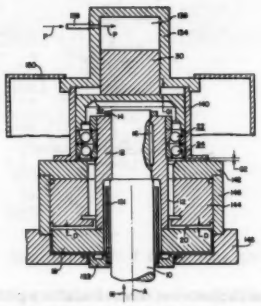
a rotor shaft subjected to an axial force;

a shaft runner located around and locked to a portion of said shaft;

a bearing runner connected to said shaft runner and extending radially outward from said shaft, said bearing runner having a bearing surface located in a plane perpendicular to said axis;

a thrust bearing member disposed in a fixed axial location to run on said bearing surface;

means for relieving force between said bearing runner and said thrust bearing member during start up of the machine comprising (a) additional bearing means, for running said shaft runner in relation to a housing member fixed to said thrust bearing member, comprising at least one ball bearing having an outer race joined to said housing member, an inner race joined to said shaft runner, and a plurality of rotatable balls between said outer race and said inner race,



(b) a hydraulically operated piston in a cylinder located directly axial of said shaft, and (c) a piston thrust plate located axially between said piston and an end of said shaft to move in response to axial motion of said piston and to apply force to said additional bearing means, which force is transmitted to said shaft runner and said bearing runner to relieve the axial force between said bearing runner and said thrust bearing member at said bearing surface, said piston, said piston thrust plate, said ball bearing, said shaft runner, and said bearing runner are arranged for axial force transmission from said piston to, in sequence, said piston thrust plate, said ball bearing outer race, said rotatable balls, said ball bearing inner race, said shaft runner, and said bearing runner.

4,492,482

THERMAL HEAD DRIVING SYSTEM

Yasuhito Eguchi, Kanagawa, and Izumi Kariya, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 25, 1983, Ser. No. 460,907
Claims priority, application Japan, Jan. 25, 1982, 57-9656; Jan. 25, 1982, 57-9657
Int. Cl.³ B41J *3/02*; G01D *15/10*
U.S. Cl. 400—120 18 Claims

1. An apparatus for thermally printing data onto a medium, comprising:

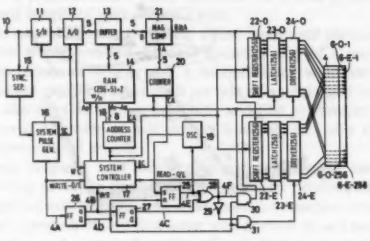
thermal head means having a first group of heat elements and a second group of heat elements arranged in interleaved relationship with said first group and in which all of said heat elements are arranged in a line;

memory means for storing data consisting of a plurality of separate data points to be printed by said thermal head means;

first driving means receiving alternate ones of said plurality of separate data points from said memory means and

connected to said first group of heat elements comprising every other heat element of said thermal head means;

second driving means receiving the remaining ones of said plurality of separate data points from said memory means and connected to said second group of heat elements comprising the remaining ones of said heat elements of said thermal head means; and



means for selectively sequentially activating said first and second driving means, whereby said every other ones of said plurality of separate data points are printed simultaneously by said first group of heat elements during a first time period and said remaining ones of said plurality of separate data points are printed simultaneously by said second group of heat elements during a second time period that does not overlap said first time period.

4,492,483

MEANS FOR DETECTING THE END OF A RIBBON FOR TYPEWRITERS

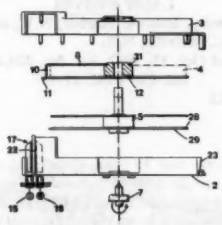
Errick Guillaume, Moudon, Switzerland, assignor to Hermes Precisa International S.A., Yverdon, Switzerland

Filed Mar. 8, 1983, Ser. No. 473,328

Claims priority, application Switzerland, May 14, 1982, 3005/82

Int. Cl.³ B41J *35/28*

U.S. Cl. 400—208 **1 Claim**



1. Means for detecting the end of a ribbon (6) for a typewriter having a cassette comprising a case (1), a supply spool (4) and a receiving spool (5) in said case, drive means (7) engageable with said receiving spool, said receiving spool receiving used ribbon, said detecting means including an optical reader (14) comprising a light source (15) emitting a luminous flux to illuminate a portion of said ribbon (6) and a detector (16) for detecting the luminous flux coming from said illuminated portion of ribbon, said light source and said detector fixed on said typewriter and adapted to respectively transmit and receive parallel beams of luminous flux with said beams in turn parallel to the transverse extent of said ribbon (6), characterized in that said cassette includes luminous flux transmitting means comprising two light guides (18,19) integral with the case (1), one of said guides (18) disposed adjacent one side of said ribbon so as to transmit the flow of light emitted by said light source (15) to that one side of said ribbon (6), the other of said guides (19) disposed adjacent an opposite side of said ribbon so as to receive the luminous flow of light which transverses the ribbon and to transmit that luminous flow of light to said detector (16), said luminous flux transmitting means (17) integral with the case of the cassette and said light guides (18,19) comprising two parallel prismatic bodies each having a longitudinal axis and with upper ends including two faces oriented relative to the longitudinal axis of each of said bodies so as to reflect the light from one of said guides (18) towards the other guide (19) with said ribbon (6) being moved between said two faces.

4,492,484

IMPROVED RIBBON MASK AND GUIDE FOR WIRE DOT PRINTERS

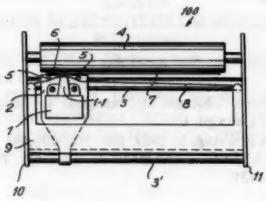
Hiroyuki Akazawa, Shiojiri, and Kazue Yoshile, Okaya, both of Japan, assignors to Epson Corporation, Tokyo; Okaya Kogyo Kabushiki Kaisha, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, all of, Japan

Filed Aug. 13, 1982, Ser. No. 407,859

Claims priority, application Japan, Aug. 21, 1981, 56/124012[U]

Int. Cl.³ B41J *35/04, 35/26*

U.S. Cl. 400—248 **16 Claims**



1. A printing device for use in a wire dot printer having a plurality of printing wires, comprising a frame, a carriage means slidably supported on said frame for lateral translation thereacross, printing head means supported on said carriage means having a nose member for holding said plurality of wires, first and second holding means disposed on said carriage means so that said nose member is intermediate said first and second holding means, a ribbon mask constructed from an elastic material and disposed on said nose member, said ribbon mask being removably held between said first and second holding means so as to extend across said nose member, said printing head means including a nose guide coupled to said nose member, and an ink ribbon having upper and lower edges disposed intermediate said nose guide and said ribbon mask, said nose guide having first and second projections disposed proximate said upper and lower edges of said ink ribbon respectively to limit longitudinal movement of said ink ribbon therebetween, said first and second holding means being pin-shaped and being disposed on opposite sides of said nose member, said first and second holding means each including spaced step portions.

4,492,485

ERROR CORRECTING TYPEWRITER FOR SIMPLIFIED WORD OBLITERATION

John C. Gall, Chicago, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.

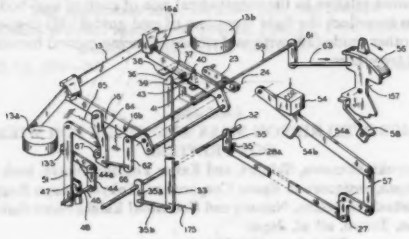
Filed Sep. 2, 1980, Ser. No. 183,547

Int. Cl.³ B41J *29/16*

U.S. Cl. 400—697.1 **10 Claims**

1. In a typewriter having ribbon means for providing a printing and a print obliterating field, means for supporting paper thereon, printing means, means for positioning a printing point, and instrumentalities for providing individual character obliteration with or without initial backspacing, together with

means for preventing forward advancement of the printing point relative to paper on said supporting means following an obliterating operation to permit insertion of a single correct character without further manipulation of the printing point



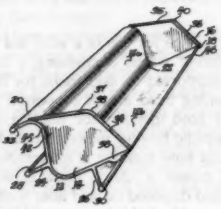
positioning means, the improvement comprising optional means for selectively effecting forward spacing of the printing point after each obliteration whereby to effect consecutive obliterations of a series of characters with a minimum number of operations.

4,492,486

SCOOP COATER

Melvin E. Green, Chicago, Ill., assignor to Advance Process Supply Co., Chicago, Ill.

Filed Aug. 9, 1982, Ser. No. 406,691
Int. Cl.³ B05C *1/00*; B41F *15/02*; B41L *13/18*
U.S. Cl. 401—131 **4 Claims**



1. A scoop coater for use in application of emulsion to screens for screen printing operations, the scoop coater comprising:

an extruded metal body having a trough portion for holding liquids, two legs projecting downwardly from the underside of the trough-shaped portion of the body, a handle extending along one side of the body, a lip extending along the opposite edge of the body, said body being asymmetrical with the trough having sides of different lengths,

two upstanding extruded metal end walls attached to the body to define a hollow reservoir,

a bead extending along each of the legs and handle to facilitate manual handling of the scoop coater,

guide surfaces formed on the end walls for sliding contact with a screen to aid in positioning the scoop coater at a preferred angle with respect to the screen during use and having rounded corners formed at the leading ends of the guide surfaces to prevent damage to the screen, said end walls being asymmetrical in shape and having first and second portions meeting at a pointed intersection,

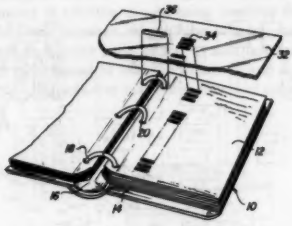
the angle between the plane of the guide surfaces and the plane of the upper surface of the trough at the lip is between 51° and 81°.

4,492,487

OVERLAY CODE SELECTION SYSTEM

Woodrow Spear, c/o OSOS, 513 W. Mt. Pleasant Ave., Livingston, N.J. 07039

Filed Apr. 1, 1982, Ser. No. 364,504
Int. Cl.³ B42F *13/00*; B42D *15/00*; B42F *21/10*
U.S. Cl. 402—79 **6 Claims**



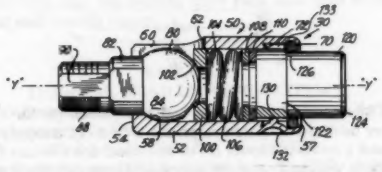
1. For use with a data sheet bearing certain printed indicia in close spaced relation to each other and a loose leaf binder having a spine and at least two rings projecting therefrom adapted to extend through holes in the sheet when inserted into the binder, a method of marking selected indicia on the sheet by use of a mark applying device, including the steps of: inserting the data sheet into the binder with the rings extending through said holes therein; placing a separate overlay mask having aligning slots and cutouts formed therein over the inserted data sheet to restrictively expose the printed indicia through the cutouts; and marking the selected indicia through the corresponding cutouts in the mask to prevent unintentional marking of portions of the data sheet bordering the selected indicia, said step of placing the mask comprising positioning the mask in the binder bridging the spine with each of the two rings respectively projecting through one of the aligning slots formed in the mask.

4,492,488

LAMP SWIVEL

Jerome Warshawsky, Baldwin Harbor, N.Y., assignor to I. W. Industries, Inc., Melville, N.Y.

Filed Oct. 15, 1982, Ser. No. 434,614
Int. Cl.³ F16C *11/00*
U.S. Cl. 403—113 **11 Claims**



1. A swivel assembly for a lamp; comprising:

(a) a swivel housing having a body portion of substantially tubular configuration and of first predetermined length and having a first end and a second end;

(b) a swivel unit disposed within said housing proximate said first end thereof, said swivel unit and said first end of said housing being respectively formed to permit rotation of said swivel unit with respect to said housing about a first predetermined axis of rotation and through a first predetermined angle of rotation;

(c) a tailpiece unit disposed within said housing at said second end, said swivel housing and said tailpiece unit being respectively formed to permit rotation of said housing

with respect to said tailpiece unit about a second predetermined axis of rotation;

(d) spring means located between said swivel unit and said tailpiece unit to urge each unit against its respective end of said housing; and

(e) said tailpiece unit having a predetermined configuration and including an outer surface at least a portion of which is of a predetermined outer diameter for a first predetermined length of said tailpiece unit;

(f) said swivel housing including a first inner wall portion of a first predetermined internal diameter and of a second predetermined length, and a second inner wall portion adjacent said first inner wall portion of an enlarged internal diameter, in comparison with said first predetermined internal diameter of said swivel housing, and of a third predetermined length;

(g) said tailpiece unit being disposed within said swivel housing so that a first section of said first predetermined length of said tailpiece unit is disposed for coaction with at least a portion of said first inner wall portion of said swivel housing and a second section of said first predetermined length of said tailpiece unit is disposed to be concentric with and spaced from said second inner wall portion of said swivel housing;

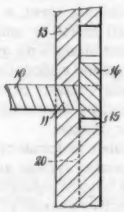
(h) said second inner wall portion of said swivel housing meeting said first inner wall portion of said housing at a shoulder.

4,492,489

MORTICE AND TENON JOINT

Roy H. Kantorowich, Manchester, England, assignor to The Victoria University of Manchester, Manchester, England

Filed Aug. 22, 1983, Ser. No. 525,028
Int. Cl.³ B25G *3/00*; F16D *1/00*
U.S. Cl. 403—319 7 Claims



1. A mortice and tenon joint of two structural members, characterized in that across the tenon of one member there is cut a passage of tapered cross section, and in that a movable wedge having a similar tapered cross-section is slidably housed within a channel also of similar tapered cross-section which intersects the mortice of the other member, whereby when the tenon is inserted into the mortice, the wedge may be driven along the channel to become firmly engaged within said passage to prevent the members from separating until the wedge is withdrawn.

4,492,490

ROAD REPAIR SPREADER

David R. Christine, 925 Township Rd. 2408, R.D. #1, and John F. Terry, Jr., 2488 State Rte. 39, both of Perrysville, Ohio 44864

Filed Jun. 25, 1982, Ser. No. 392,276
Int. Cl.³ E01C *19/15*
U.S. Cl. 404—108 8 Claims

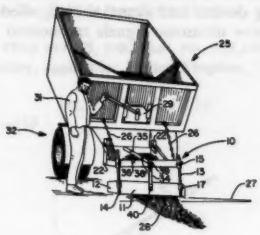
1. A road repair spreader, comprising:

a frame adapted for attachment to a vehicle;

first and second sleeves affixed to said frame in spaced-apart relationship to each other;

a mold board;

first and second shafts having first ends thereof respectively slidingly received by said first and second sleeves and



second ends thereof pivotally connected to said mold board; and wherein

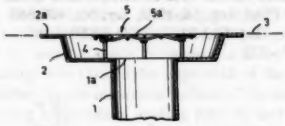
said shafts pass through brackets on said mold board, said brackets restricting pivotal movement of said shafts.

4,492,491

RAIN WATER ROOF OUTLET OR SIMILAR FOR A BUILDING

Risto Lundèn, and Olavi Ebeling, both of Helsinki, Finland, assignors to Oy Kontekia, Helsinki, Finland

Filed May 26, 1982, Ser. No. 382,120
Claims priority, application Finland, Jun. 2, 1981, 811700
Int. Cl.³ E02B *5/08*; E03F *5/14*; E04D *13/04*
U.S. Cl. 405—119 6 Claims



1. A rain roof outlet for a building comprising: a vertical drain pipe leading from a roof having a roof line, a trough arranged in the roof and adapted to collect water from the roof, the trough having a bottom and side walls which have upper edges in line with the roof line, the drain pipe having an upper end forming a mouth which is connected with the bottom of the trough so as to drain the water collected in the trough from the roof; and means for retarding circumferential whirling of water about the axis of the axis of the drain pipe as the water enters the mouth of the drain pipe, said means being a lid in the form of a net having a large number of perforations, and having a rough lower surface, said net being located substantially at the roof line and providing a resistance to circumferential flow of water through and along the surfaces of the net thereby creating full flow of water into said mouth.

4,492,492

GUIDING METHOD FOR CABLE BURYING DEVICE AND A DEVICE THEREFOR

Toshio Izawa, Tokyo; Yoshinao Iwamoto, Fujimi; Yuichi Shirasaki, Tokyo, and Kenichi Asakawa, Hachiohji, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1981, Ser. No. 250,264
Claims priority, application Japan, Sep. 22, 1980, 55-130610
Int. Cl.³ F16L *1/04*; G01S *5/18, 15/06*
U.S. Cl. 405—160 2 Claims

1. A cable position confirming device for a cable burying device comprising four ultrasonic receiving elements arranged in the form of a rectangle on the cable burying device in a

plane beneath the cable burying device and parallel to a horizontal surface thereof, an ultrasonic transmitter/receiver element provided at the center of said rectangle, and two ultrasonic transponders mounted on a cable to be buried by said cable burying device, said elements being used descriminatingly to receive ultrasonic signals transmitted by said two

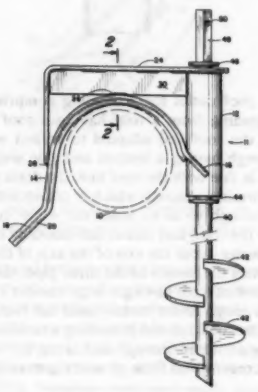
ultrasonic transponders in response to ultrasonic transmission command signals transmitted by said transmitter/receiver element, the distance between pairs of said receiving elements forming parallel sides of said rectangle being substantially equal to the distance between said two ultrasonic transponders, whereby to facilitate accurate measurement of the position of the cable.

4,492,493

PIPELINE ANCHOR HOOK

Brian C. Webb, 4236 S. 76th E. Ave., Tulsa, Okla. 74145

Filed Aug. 16, 1982, Ser. No. 408,665
Int. Cl.³ F16L *1/00*; E02D *5/80*
U.S. Cl. 405—172 **7 Claims**



1. A ground held anchor to restrain upward movement of buried or submerged pipeline or other articles comprising:

a sleeve;

an arcuate saddle one end of which is attached to said sleeve and extending outward thereof, said saddle of interior configuration to fit over said pipeline or article;

a saddle structural support means attached to said sleeve and extending outwardly therefrom, said support means attached to the exterior of said saddle to prevent bending of said saddle from said upward movement of said pipeline.

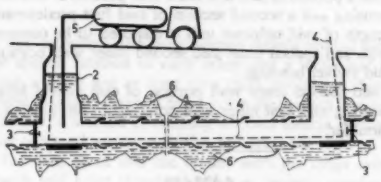
an anchor rod rotatably supported within said sleeve, said rod having at least one ground engaging fluke, said rod being bendable, before disengagement of said anchor rod and fluke, from the ground, at a point along its length just below said sleeve due to said upward movement.

4,492,494

PROCESS FOR STABILIZING AQUEOUS SOLUTIONS USED IN THE PREPARATION OF HYDROPHILIC POLYMERIC GELS

Tamás Székely; Ferenc Csanda; Gábor Nagy, and Gyozo Czerny, all of Budapest, Hungary, assignors to Magyar Tudományos Akadémia Természettudományi Kutató Laboratórium and Földmérö és Talajvizsgáló Vállalat, both of Budapest, Hungary

Continuation of Ser. No. 957,804, Nov. 6, 1978, abandoned. This application Aug. 5, 1981, Ser. No. 290,315
Claims priority, application Hungary, Nov. 8, 1977, MA 2924
Int. Cl.³ E02D *3/12*
U.S. Cl. 405—264 **7 Claims**



1. A process for improving the strength and impermeability of particulate materials or solid articles, comprising the steps of:

(a) stabilizing an aqueous gel-forming system comprising a water-soluble acrylic monomer as gellifying agent, methylenebis-acrylamide co-monomer or a mono- or bivalent aldehyde as cross-linking agent, a redox catalyst system containing an alkali metal or ammonium persulfate as oxidizing component along with an amine compound as reducing component, and optionally a water-soluble polymer for adjusting the viscosity of the solution or modifying the gel structure, by saturating said gel-forming system with molecular oxygen;

(b) treating the particulate materials or the solid articles with said aqueous gel-forming system; and

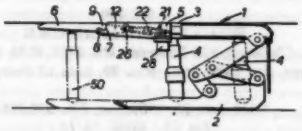
(c) finally suspending oxygen saturation of the gel-forming system after an effective amount of oxygen is introduced in the system.

4,492,495

ROOF SUPPORT FOR USE IN MINES

Dennis F. Rutherford, and Keith D. Blackmore, both of Cheltenham, England, assignors to Dowty Mining Equipment Limited, Great Britain

Filed Jun. 13, 1983, Ser. No. 503,849
Claims priority, application United Kingdom, Jul. 9, 1982, 8219955
Int. Cl.³ E21D *17/02*
U.S. Cl. 405—294 **10 Claims**



1. A mine roof support including a roof-engageable beam which comprises a main portion, a further portion forming an extension of the main portion and hinged thereto by a pin-less knuckle joint, said further portion having a rear part which

projects beyond said knuckle joint and beneath the underside of said main portion with which the rear part is engageable to limit pivotal movement of said further portion about said joint, and retaining means to provide security of connection of said further portion to said main portion a said retaining means being pivotally connected to the rear part of the extension and pivotally connected to the main portion, the pivotal connections permitting movement of the rear part vertically but preventing lateral movement of said rear part.

4,492,496

METHOD OF ATTACHING A STUB TO A POLE

Victor Arnold, Mosman, Australia, assignor to Austpole Pty., Ltd., Victoria, Australia

Division of Ser. No. 187,994, Sep. 17, 1980, Pat. No. 4,371,018. This application Sep. 30, 1982, Ser. No. 429,862

Claims priority, application Australia, May 20, 1980, PE03723

Int. Cl.³ E02D *37/00*; E04H *12/00*

U.S. Cl. 405—303 **15 Claims**

1. A method of attaching a stub to a pole partially embedded in the ground, said method comprising:

providing apparatus having movable pole clamping means;

bringing the apparatus into operative position adjacent the pole;

engaging the clamping means with the pole;

raising the clamping means and the pole to expose a lower end portion of the pole, whereby the apparatus bears the effective weight of the pole and any additional force needed for initial disengagement of the pole from the ground;

providing a replacement stub and sleeve junction means of deterioration-resistant material, the sleeve junction means adapted to join and enclose a conjunction between the pole lower end portion and the stub;

positioning the stub in an underpinning, abutted position relative the pole lower end portion;

securing the sleeve junction means to join the stub and the lower end portion of the pole;

lowering the pole clamping means so that the pole and stub are lowered vertically to a predetermined depth with the sleeve junction at least partially below ground level and whereby the weight of the restored pole is taken by the ground;

consolidating the ground around the pole; and,

removing the apparatus.

4,492,497

APPARATUS AND METHOD FOR TRANSFERRING SOLIDS

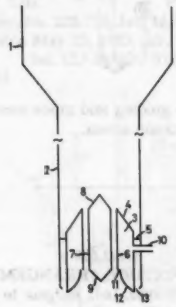
John L. Barclay, Tadworth; Alan G. Brooks, Bagshot, and Clive P. J. Duebel, Meopham Green, Nr. Gravesend, all of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Mar. 5, 1982, Ser. No. 355,148

Claims priority, application United Kingdom, Mar. 26, 1981, 8109528

Int. Cl.³ B65G *53/14*

U.S. Cl. 406—153 **2 Claims**



1. Apparatus for transferring solid particles to a receptacle from a storage hopper (1), which apparatus comprises a primary loading tube, a Coanda surface and a Coanda nozzle characterised by the fact that the primary loading tube (2) contains at its lower end an annular gas supply chamber (3) spaced inwardly of the tube (2) and coaxially aligned within it to provide an annular space between the inner wall of the primary loading tube (2) and the outer wall of the annular gas supply chamber (3), the innermost surface of the annular chamber (3) forming a secondary loading tube (6) and at its lower end forming a Coanda surface (12), a slot (11) being provided between the innermost surface of the gas supply chamber (3) and the Coanda surface (12) to form a Coanda nozzle said primary loading tube and said secondary loading tube being open at each end and the secondary loading tube (6) contains at its lower end a cylinder (7) coaxially aligned within it to provide an annulus for the passage of solid particles the aforementioned apparatus providing satisfactory distribution of solid particles at high loading rate with efficient utilization of gas.

4,492,498

DRILL BIT JIG

Emery M. Kaufman, R.R. 1, 1699 E.B. Rd., Bremen, Ind. 46506

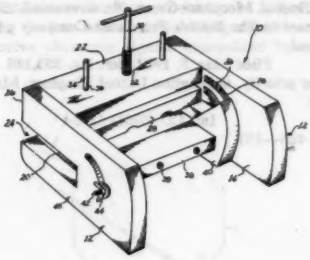
Filed Aug. 18, 1982, Ser. No. 409,125

Int. Cl.³ B23B *47/28*

U.S. Cl. 408—115 R **4 Claims**

1. An adjustable jig for guiding the bit of a drill into a workpiece, said jig comprising end plates having opposed inner faces, guide means for directing said drill bit extending between said end plate inner faces, clamp means carried between said end plates and opposed to said guide means for retaining said workpiece adjacent said guide means, slide means associated with said end plates and said guide means at each end thereof for selectively moving the guide means toward and away from the clamp means, wherein said guide means may be shifted through said slide means to butt against said work piece to guide said drill bit into the work piece, said slide means defining arcuate grooves formed in one of said guide means

and said end plates and further defining arcuate ribs carried by the other of said guide means and said end plates which interfit



into said grooves for guiding said guide means in an arcuate path relative to said clamp means.

4,492,499

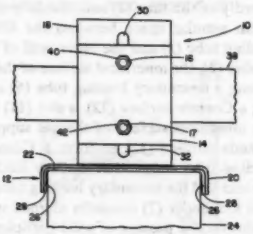
FRAME FIXTURE ARRANGEMENT

John S. Gasper, Fort Wayne, Ind., assignor to North American Van Lines, Inc., Fort Wayne, Ind.

Continuation-in-part of Ser. No. 252,026, Apr. 8, 1981, abandoned. This application Aug. 5, 1983, Ser. No. 520,719

Int. Cl.³ B60P *7/10, 7/14;* **B61D** *45/00*

U.S. Cl. 410—32 **6 Claims**



1. A frame fixture apparatus for stabilizing goods within a transport vehicle, wherein said goods include a plurality of breakable equipment items which tend to topple about one pivot plane and are stable in other directions, said items being arranged in spaced relationships in said vehicle whereby said items tend to topple towards each other, and said apparatus including a plurality of clamping devices for interlinking said items and forming a rigidly interconnected stabilized structure preventing toppling of said items, each said clamping device comprising:

a. a base having a gripping means for gripping the edges of a surface of said item on which said base is positioned;

b. an upright post having a pair of slots therein, said post being affixed to said base so as to provide a surface in coplanar relationship with the posts on the bases arranged on the other items in said vehicle;

c. a plate having a pair of holes therein;

d. means for attaching said plate to said post; and

e. an elongate cargo bar extending between said items in the toppling plane of said items intermediate each said post and plate so as to be clampingly engaged therebetween by said attaching means and to form a rigidly interlinked bracing frame structure with said items.

4,492,500

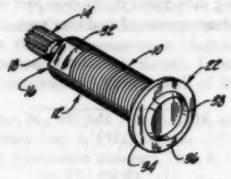
TORQUE LIMITING SET SCREW

Peter D. Ewing, 7011 Biscayne, Milford, Mich. 48042

Filed Feb. 10, 1983, Ser. No. 465,672

Int. Cl.³ F16B *31/02, 35/00*

U.S. Cl. 411—5 **5 Claims**



1. A torque limiting set screw of the type comprising a unitary body including a threaded shank and a tightening head at one end of the shank,

the tightening head being adapted to be engaged by a torque applying tool for tightening the set screw,

the tightening head being joined with the shank by a torque control neck having a torsional breaking strength less than the other portions of said body,

the improvement including:

the major transverse dimension of said tightening head being no greater than the diameter of said shank,

a seating head at the other end of said shank and having an axial seating surface with a surface area larger than the cross-sectional area of said shank,

a point extending from the seating surface for engaging a member to be retained when the set screw is tightened,

the breaking strength of said torque control neck being great enough to permit sufficient tightening of the set screw to cause indentation of said member by the point,

the breaking strength of the torque control neck being small enough so that continued tightening of the set screw after the seating surface engages said member will cause the tightening head to break off.

4,492,501

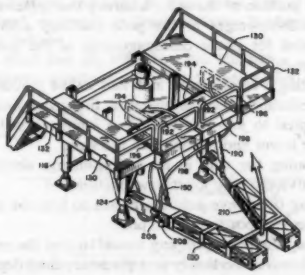
PLATFORM POSITIONING SYSTEM

Keith M. Haney, Wichita Falls, Tex., assignor to Walker-Neer Manufacturing Company Inc., Wichita Falls, Tex.

Filed Apr. 11, 1983, Ser. No. 483,560

Int. Cl.³ E04H *12/18;* **E21B** *15/00*

U.S. Cl. 414—22 **10 Claims**



9. In combination with a drilling apparatus of the type having a support structure and a transfer arm pivotably connected to the support structure to rotate about a first axis, the improvement comprising:

a platform pivotably connected to the support structure to

rotate about a second axis, parallel to the first axis, said transfer arm and platform pivotable about the respective axes between respective raised and lowered positions, said platform when positioned in the lowered position situated to obstruct movement of the transfer arm into the raised position;

a telescoping rod comprising first and second rod sections and means for securing the first and second rod sections together to provide axial movement therebetween for a first distance;

means for mounting the first rod section to the platform such that the first rod section pivots about a platform axis and is movable through a first angular range in a plane passing through the platform axis; and

means for mounting the second rod section to the transfer arm such that the second rod section pivots about an arm axis and is movable through a second angular range in a plane passing through the arm axis;

a guard rail pivotably mounted to the support structure adjacent the platform;

the position of the arm and platform axes and the length of the telescoping rod selected such that the transfer arm automatically and progressively raises the platform to the raised position by means of the rod as the transfer arm moves to the raised position, and the transfer arm automatically and progressively lowers the platform to the lowered position by means of the rod as the transfer arm moves to the lowered position;

the length of the rod and the first distance chosen such that movement of the transfer arm within a predetermined range of positions adjacent the lowered position produces no movement of the platform from the lowered position; and

means for automatically pivoting the guard rail to a first position along the edge of the platform adjacent the transfer arm when the platform is in the lowered position and for automatically pivoting the guard rail out of the path of the platform as the platform moves to the raised position.

4,492,502

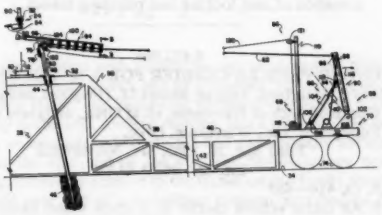
TECHNIQUE FOR PICKING UP AND LAYING DOWN PIPE

Charles G. Delano, Guaranty Bank Plaza, Corpus Christi, Tex. 78475

Continuation of Ser. No. 335,258, Dec. 28, 1981, abandoned. This application May 27, 1983, Ser. No. 498,738

Int. Cl.³ E21B *19/00*

U.S. Cl. 414—22 **16 Claims**



1. A laydown unit for transporting pipe joints between a first location and a rig floor providing a rotary table at a higher elevation, comprising

an upstanding support on the rig floor between the rotary table and the first location;

a base unit and a bull line extending between the base unit and the upstanding support;

a pipe carrier, supported on the bull line, including means for supporting a joint of pipe;

means for propelling the pipe carrier from the first location toward the rotary table; and

means for moving the pipe joint over the top of the upstanding support to deliver the pipe joint adjacent the rotary table.

4,492,503

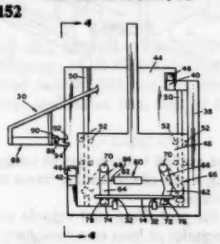
HIGH SPEED PUSHER

Paul M. Thomas, Paradise Valley, and Daniel P. Abrahamson, Phoenix, both of Ariz., assignors to Builders Equipment Company, Phoenix, Ariz.

Continuation of Ser. No. 225,714, Jan. 16, 1981, abandoned. This application May 23, 1983, Ser. No. 496,331

Int. Cl.³ B66C *17/08*

U.S. Cl. 414—152 **6 Claims**



1. In an apparatus for conveying and lifting blocks on rigid pallets to an elevated position for being loaded into a loading opening of a kiln with the apparatus including a conveyor extending parallel to the face of the loading opening for conveying palletized blocks to a position beneath the loading opening, the width of said pallets being the distance across said pallet in a direction perpendicular to the conveyor and the length of the pallets being the distance across the pallet in a direction parallel to the conveyor, the improvement comprising:

a pair of elongated pallet support arms, each having first and second ends disposed longitudinally in an orientation generally parallel to the conveyor and having a length between said first and second ends of about the length of the pallets for being disposed below and along the length of the pallets;

lifting means;

mounting means for mounting only said first end of each of said support arms on said lifting means and providing for lateral movement of said support arms in a direction generally perpendicular to the conveyor;

actuation means for moving said support arms laterally between a clearance position, wherein said support arms are spaced apart at a distance greater than the width of the pallets, and a support position, wherein said support arms are spaced apart at a distance less than the width of the pallets;

said lifting means being operable to move said support arms between a lowered position that is at least beneath the level of the conveyor and a raised position wherein said support arms are level with the lower surface of the loading opening of the kiln, whereby palletized blocks may be lifted from the conveyor by moving said support arms to the clearance position, lowering said support arms to the lowered position, moving said support arms to the support position beneath the pallet on the conveyor, raising said support arms to the raised position to raise the palletized blocks to the level of the loading opening of the kiln; and

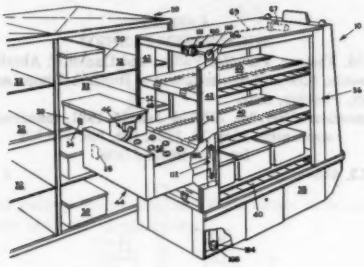
pusher means for pushing palletized blocks in a direction perpendicular to the length of said support arms and the conveyor when said support arms are in the raised position to push the palletized blocks into the loading opening.

4,492,504

MATERIALS HANDLING SYSTEM

Thomas E. Hainsworth, Holland, Mich., assignor to Bell & Howell Company

Filed Dec. 7, 1981, Ser. No. 327,789
Int. Cl.³ B60P *1/46*
U.S. Cl. 414—273 **19 Claims**



1. An unmanned guided vehicle system comprising:

a frame including a pair of upstanding frame members at one end of said vehicle;

traction means for propelling said vehicle along a selected path which includes at least one stationary location;

guide means for guiding movement of said vehicle along said selected path;

first control means for controlling the movement of said vehicle along said selected path;

storage means on said vehicle and extending to said upright frame members for storing at least one container on said vehicle;

transfer means mounted to said frame members for vertical movement along the outward side of said frame members for moving said at least one container from said at least one stationary location vertically along said outward side of and between said frame members to said storage means on said vehicle; and

second control means coupled to said transfer means for selectively controlling the transfer of said at least one container between said at least one stationary location and said storage means;

wherein said vehicle is propelled along said path to said at least one stationary location whereupon said at least one container is moved from said storage means to said transfer means and then along the outward side of said frame members to said at least one stationary location or said container is moved from said stationary location by said transfer means and is then moved through said frame members to said storage means.

4,492,505

CLAMPING DEVICE FOR USE ON HAND TRUCK

Donald T. Dunning, 224 W. Boeing Dr., Midwest City, Okla. 73110

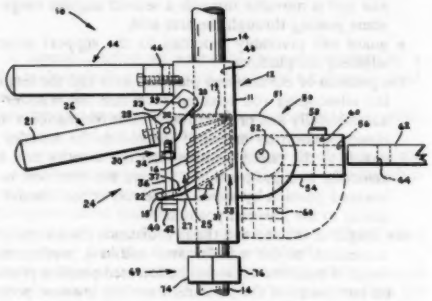
Filed Jan. 27, 1982, Ser. No. 343,043
Int. Cl.³ B62B *1/06*
U.S. Cl. 414—454 **5 Claims**

1. A clamping device for securing a load on a load carrying surface comprising:

means for mounting said clamping device to a side of said load carrying surface, said means for mounting including a plurality of brackets and a guide rod, said brackets fixedly secured to a side tube on said load carrying surface and said guide rod being essentially parallel with said side tube, said brackets being fixedly attached to the ends of said guide rod,

a control body attached to said mounting means for reciprocal movement thereon as required by the shape of said load, said control body including a housing and a handle, said handle attached to said housing, said housing having said guide rod passing therethrough and being a rectangular solid box having a guide rod hole therein and a recess therein having an inclined seat,

means for locking and releasing said control body, said locking and releasing means attached to said control body and said mounting means, said means for locking and releasing including a release lever, a connecting rod assembly, a plurality of clamps, and a spring, said release lever pivoting on said housing so that said operator is able to squeeze said handle of said control body and the handle of said release lever together with one hand, said connecting rod at one end pivoting on said release lever, the other end of said connecting rod attached to a master release



clamp, said master release clamp being adjacent to said inclined seat of said housing, said plurality of clamps having said guide rod therethrough and having elliptical holes therein for said guide rod, when said release lever is not actuated, said clamps lock on said guide rod, said spring having said guide rod therethrough and said spring positioned between said housing and said plurality of clamps, said spring biasing said clamps against said inclined seat, and

means for contacting said load to secure said load on said load carrying surface, said contacting means attached to said control body so that when an operator actuates said locking and releasing means, said control body can be moved on said mounting means such that said contacting means operably secures the load when the operator ceases actuation of said locking and releasing means.

4,492,506

UNDER VEHICLE CARRIER FOR A SPARE WHEEL

Merle R. Hoagland, Astoria; Robert M. Hoagland, and Dean W. Hoagland, both of Warrenton, all of Oreg., assignors to DMB Enterprises, Inc., Warrenton, Oreg.

Filed Apr. 29, 1983, Ser. No. 489,825
Int. Cl.³ B62D *43/04*
U.S. Cl. 414—463 **13 Claims**

5. An under vehicle carrier for a spare wheel having a tire portion mounted to a central rim portion, comprising.

an elongated body adapted for mounting to the underside of a vehicle with a first end portion of the body adjacent to a side or end margin of the underside of the vehicle;

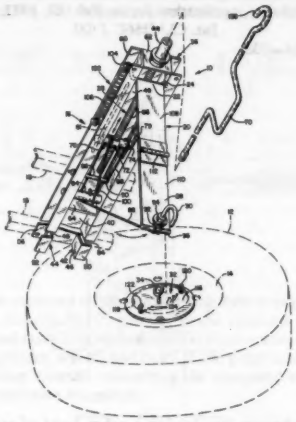
arm means for supporting the spare wheel;

pivot means for pivoting one end portion of said arm means to said body for movement about a horizontal pivot axis to permit raising and lowering of the free end of said arm means;

biasing means for biasing said arm means to a lowered position;

arm operating means for raising and lowering said arm means;

spare wheel coupling means for releasably coupling the spare wheel to the free end portion of the arm means such that the spare wheel is lowered through an arc and delivered partially out from underneath the vehicle as said arm



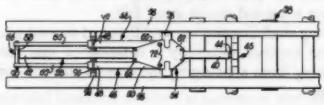
means is lowered and raised through an arc as said arm means is raised; and

said pivot means including a crank portion, said biasing means comprising biasing spring means connected to said body and to said crank portion.

4,492,507

ACTUATOR FOR SHIFTABLE UNDERCARRIAGE OF TILTABLE TRAILER

Donald R. Landoll; David J. Kongs, and Alfred R. Belknap, all of Marysville, Kans., assignors to Landoll Corporation, Marysville, Kans.

Filed Mar. 10, 1983, Ser. No. 474,128
Int. Cl.³ B60P *1/04*
U.S. Cl. 414—475 **14 Claims**

1. In combination with a trailer having an elongated, tiltable bed provided with a deck and an elongated, underlying deck-supporting frame, said bed being normally disposed in a substantially horizontal, roading position, and a wheeled, bed-supporting undercarriage beneath the bed and normally disposed adjacent the rear end of the bed, said undercarriage being shiftable forwardly relative to the frame longitudinally thereof from said rear end to a bed-tilting position intermediate the front and rear ends of the bed,

an undercarriage control assembly beneath the bed for shifting the undercarriage fore and aft, said assembly including:

support structure suspended from the frame adjacent said front end of the bed;

a double acting, primary, fluid pressure piston and cylinder unit having an elongated cylinder carried by said structure for fore and aft reciprocation longitudinally of the frame,

said cylinder having a forwardmost butt end and a reciprocable, rearwardly extensible piston rod at the rearmost end of the cylinder;

a coupling attaching the rod to the undercarriage;

a pair of double acting, secondary, fluid pressure, piston and cylinder units alongside the primary unit, each having an elongated cylinder provided with a rearmost butt end and a reciprocable, forwardly extensible piston rod at the forwardmost end of its cylinder;

means attaching the butt ends of the cylinders of the secondary units to said structure; and

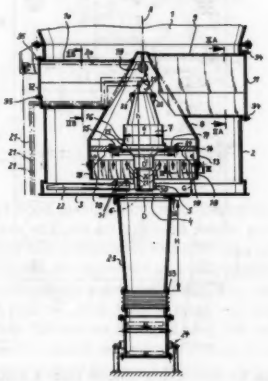
apparatus connecting the butt end of the cylinder of the primary unit to the rods of the secondary units whereby, upon application of fluid pressure to the cylinders, the rods of the secondary units first shift the primary unit and the undercarriage fore and aft a predetermined distance and, thereupon, the rod of the primary unit shifts the undercarriage fore and aft an additional distance.

4,492,508

BULK-STORAGE APPARATUS WITH UNLOADER

Lothar Teske, Hegelstr. 15, D-5000 Köln, Fed. Rep. of Germany

Filed Jun. 9, 1982, Ser. No. 386,594
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3125110
Int. Cl.³ B65G *65/48*
U.S. Cl. 414—304 **17 Claims**



1. A bulk-storage apparatus comprising:

a large hopper adapted to hold a large supply of bulk material and having a floor formed with a central outlet opening defining a vertical axis and a side wall extending upward from said floor;

an upwardly tapered hood generally centered on said axis and open downwardly toward said opening, said hook having a lower edge vertically spaced from said floor around said opening;

at least one tubular traverse supporting said hood in said hopper and having an inner end secured to and opening into said hood and an outer end secured to and opening outside said hopper, said traverse being of a cross-sectional size big enough that a man can crawl between outside said hopper and inside said hood along said traverse;

an openable cover closing said traverse between said ends;

a drive motor supported in said hood and accessible through said tubular traverse, said drive having a rotary output projecting down into the space between said floor and said lower edge above said opening, whereby a man can crawl through said traverse into said hood to service said drive while said hopper is full, said drive motor being of smaller horizontal cross section than said opening;

means for vertically displacing said drive through said opening; and

an arm carried on said output and sweepable over said floor around said opening by said drive.

4,492,509

OBJECT-CONVEYING BOX, AND OBJECT-SORTING MACHINE EQUIPPED WITH SUCH BOXES

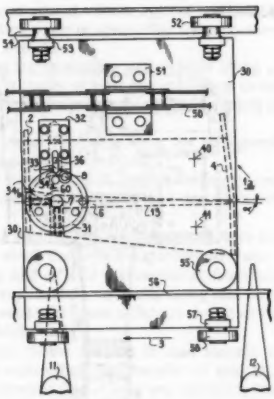
Michel Divoux; Hubert Bonansée, and Bernard Constant, all of Paris, France, assignors to Hotchkiss-Brandt Sogeme H.B.S., Paris, France

Filed Apr. 27, 1981, Ser. No. 257,653

Claims priority, application France, Apr. 29, 1980, 80 09622

Int. Cl.³ B65G *17/36*

U.S. Cl. 414—387 **13 Claims**



1. Apparatus for conveying objects from a loading zone to an ejection zone, said apparatus comprising:

(a) a set of walls defining a frame;

(b) a bottom mounted at the front of said frame for pivotal movement about an axis such that, when said bottom is pivoted open by the force of gravity, an object being conveyed by the apparatus is permitted to fall vertically into a receptacle intended to receive it;

(c) a trunnion operatively connected to said bottom such that prevention of the pivotal motion of said trunnion prevents pivotal motion of said bottom, said trunnion being mounted for pivotal movement about the same axis as said bottom;

(d) a retractable finger which is mounted on one of said walls and which engages in a first notch provided in said trunnion during the loading and conveying phases, thereby preventing pivotal motion of said trunnion;

(e) a cam and cam follower arrangement which cams said retractable finger out of said first notch, thereby permitting said bottom to begin pivoting open due to the force of gravity, said cam and cam follower arrangement being positioned and said bottom being mounted on said walls sufficiently far above the lower edges of said walls so that said bottom does not pivot beneath said walls before the box formed by said set of walls and said bottom arrives at the ejection zone.

4,492,510

ROBOT HAND DRIVING MECHANISM

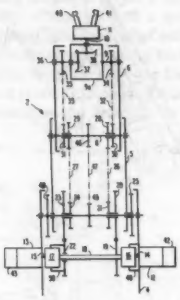
Shigetaka Tanii, and Hisao Sasaki, both of Toyama, Japan, assignors to Toyama Machine Works, Ltd., Toyama, Japan

Filed Feb. 11, 1983, Ser. No. 465,717

Claims priority, application Japan, Feb. 12, 1982, 57-21592

Int. Cl.³ B66C *1/00*

U.S. Cl. 414—733 **7 Claims**



1. A mechanism for driving a robot hand of an industrial robot, comprising:

a robot hand mounted on an arm;

a differential gear mechanism mounted on said arm for swinging the robot hand about first shaft means and for rotating the robot hand about second shaft means, said first and second shaft means being rotatably mounted within said arm;

first and second motors for driving said first and second shaft means, respectively;

first and second transmission systems for transmitting rotative power from said first and second motors respectively to said first and second shaft means;

a first planetary gear assembly disposed in said first transmission system and having a fixed first internal gear and a first planet gear operatively connected to said first shaft means;

a second planetary gear assembly disposed in said second transmission system and having a second internal gear operatively connected to said second shaft means and having a second planet gear; and

a coupling shaft connecting said first and second planet gears to one another, whereby a rotation of said robot hand resulting from a swinging movement thereof can be cancelled.

4,492,511

CONVEYOR ROBOT

Alfred Bilsing, Schwedengraben 12, 5952 Attendorn, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,571

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024432; Apr. 10, 1981, 3114476

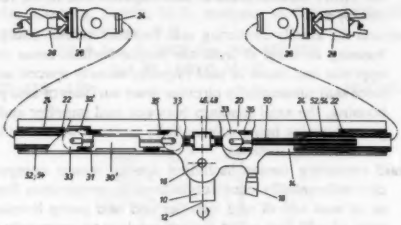
Int. Cl.³ B25J *9/00*; B30B *15/30*

U.S. Cl. 414—744 A **8 Claims**

1. A conveyor robot comprising:

an elongated arm rotatable about a vertical axis, a pair of extensions, one for supporting an engaging member at each end of the arm, such that each engaging member is movable longitudinally of the arm to extend out from and retract towards said vertical axis, each extension having a center line about which the extension is symmetrical, said extensions being mounted with their said center lines in a common vertical plane with the said vertical axis, said extensions, with their respective engaging members being movable simultaneously in opposite directions, means for swinging said arm, and hence also said extensions and said

engaging members about a common central horizontal axis, and including a separate drive means for driving each of the extensions in said longitudinal movement, each drive means comprising a double acting hydraulic cylinder mounted on the arm and including a piston rod extending out in two opposite directions, a pair of sprocket



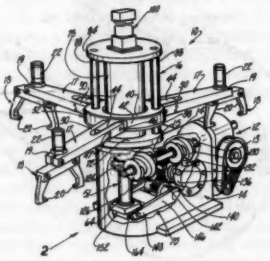
wheels mounted on the arm, having their axes perpendicular to the rod and connected to the opposed ends of the rod, and including an elongated element encircling both of said sprocket wheels and fixed at one point to the arm, and including a means connecting the elongated element and the respective extensions.

4,492,512

AMPLIFIED MOTION TRANSMITTING DEVICE

George Mink, 37900 Mound Rd., Sterling Heights, Mich. 48077

Filed Dec. 2, 1981, Ser. No. 326,552
Int. Cl.³ B66C 23/00
U.S. Cl. 414—744 A 8 Claims



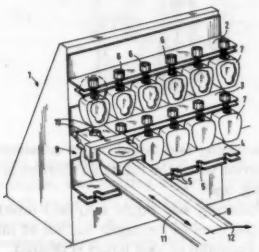
1. A material handling device for moving a workpiece along first and second paths to effect movement of the workpiece from a first location to a second location, said device comprising gripping means for gripping a workpiece to be moved, a first cam and follower arrangement for generating a defined amplitude of movement in a first degree of freedom, first motion transfer means operatively connected with said first cam and follower arrangement for transferring movement in said first degree of freedom into movement of said gripping means along said first path, a second cam and follower arrangement for generating a defined amplitude of movement in a second degree of freedom, second motion transfer means operatively connected with said second cam and follower arrangement for transferring movement in said second degree of freedom into movement of said gripping means along said second path, and transmission means interposed in the operative connection of one of said cam and follower arrangements and the motion transfer means operatively associated therewith for effecting a multiplication of the amplitude of movement in the degree freedom generated by that cam and follower arrangement to yield a different amplitude of output movement in the same degree of freedom for transfer by the associated motion transfer means into movement of said gripping means along one of said paths, said transmission means receiving a defined amplitude of oscillation about a first axis as an input movement from the associated cam and follower arrangement and generating a different amplitude of oscillation about a second axis as an output movement and comprising a sector gear assembly having a first sector gear supported for oscillation about said first axis and a second sector gear supported for oscillation about said second axis and drivingly engaged with said first sector gear.

4,492,513

WORKPIECE MANIPULATION SYSTEM

Manfred Weck, Aachen; Hans Klingel, Möglingen, and Georg Werntze, Hopfen, all of Fed. Rep. of Germany, assignors to Maho Werkzeugmaschinenbau Babel & Co., Fed. Rep. of Germany

Filed Jun. 7, 1982, Ser. No. 385,835
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1981, 3123029
Int. Cl.³ B23Q 7/04
U.S. Cl. 414—729 2 Claims



1. A workpiece manipulator, in combination with workpieces that are gripped by gripping means provided at the loading arm of and manipulator and are transported to predetermined positions of processing and/or magazine stations the workpieces comprising a detachable handling member having an enlarged hollow head (16), a relatively narrow hollow central portion (13) and an enlarged base (15), said base being curved inwardly toward said narrow central portion, the interior of said hollow head forming a relatively large reservoir for adhesive (18) and said narrow central portion and said base having a relatively small opening formed therethrough in communication with said reservoir whereby said adhesive may contact said workpiece to secure said handling member for gripping by said gripping means.

4,492,514

SUBMERGED PUMP ASSEMBLY AND METHOD OF MAKING AND USING SAME

James B. Dron, Orange, Calif., assignor to Stang Hydronics Inc., Orange, Calif.

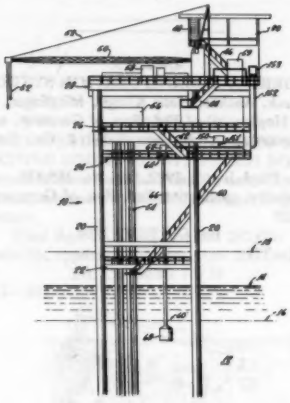
Filed Aug. 18, 1980, Ser. No. 178,844
Int. Cl.³ F04D 7/00
U.S. Cl. 415—1 29 Claims

1. In a pump assembly means for pumping a liquid from a body of said liquid wherein said means includes a rotary pump which has at least an inlet portion submerged in said body for substantial periods of time when the rotatable element in said pump is not rotating and wherein said liquid contains constituents having a tendency to impair the performance of said pump after extended contact therewith, the improvement comprising:

casing means at least partially submerged in said body of liquid and disposed about the periphery of at least said pump inlet portion and spaced apart therefrom, said cas-

ing means defining an opening at a portion thereof below said inlet portion of said pump,

means for displacing said liquid downwardly to a level below the upper surface of said body of liquid and out of substantial contact with at least the interior of said submerged portion of said pump,



means for maintaining said liquid out of substantial contact with said interior when the rotatable element in said pump is not rotating, and

means for introducing said liquid into said interior of said pump up to the level of the upper surface of said body of liquid when pumping of said liquid is desired.

4,492,515

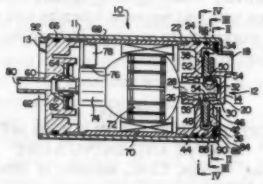
PUMP APPARATUS

Kiyohiko Watanabe, Chiryu; Kazuma Matsui, Toyohashi; Yoshiyuki Hattori, Toyoake; Toshihiro Takei, Kariya; Toshiaki Nakamura, Anjo, and Shunsaku Ohnishi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 12, 1982, Ser. No. 377,546

Int. Cl.³ F04D 1/02, 1/12

U.S. Cl. 415—53 T **9 Claims**



1. A pump apparatus comprising:

a regenerative pump including a pump housing formed therein with suction and discharge ports and a disc-like impeller mounted in said housing for rotation therein and for axial movement within a limited range;

driving means drivingly connected to said impeller to rotate the same for thereby pumping a fluid;

said impeller having substantially constant thickness and having substantially circular and substantially planar end faces and being provided with circumferential rows of radial vane grooves formed in said end faces adjacent to the outer periphery of said impeller;

said pump housing cooperating with said impeller to define a circumferential passage surrounding said circumferential rows of radial vane grooves and communicated with said suction and discharge ports;

said pump housing having substantially circular and substantially planar inner surfaces opposed to said end faces of said impeller, respectively, to cooperate therewith to form a first set of sealing sections extending over substantially the entire surface areas of said impeller end faces, respectively; and

means for axially centering said impeller within said pump housing to keep at least the major surface areas of the opposite end faces of said impeller closely spaced axially from said substantially circular inner surfaces of said pump housing, the axial spacings between said impeller and said pump housing being substantially uniform within said first set of sealing sections;

said centering means including spacer means comprising circumferentially continuous annular projections formed on at least one of said impeller and said pump housing in parts of said first set of sealing sections to cooperate with the other of said impeller and said pump housing to form a second set of sealing sections.

4,492,516

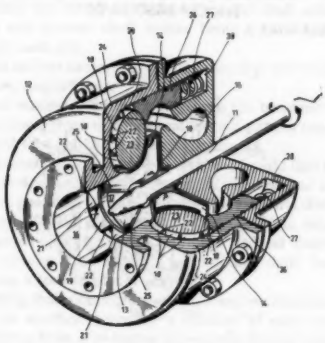
METHOD AND APPARATUS FOR CONTROLLING RECIRCULATION IN A CENTRIFUGAL PUMP

James J. McCoy, Jr., Houston, Tex., assignor to Tenneco, Inc., Houston, Tex.

Filed Sep. 30, 1982, Ser. No. 428,636

Int. Cl.³ F01D 1/12

U.S. Cl. 415—53 T **25 Claims**



1. A centrifugal pump having reinjection passageways, comprising:

a centrifugal pump, the pump having an impeller, the impeller having an inlet and discharge tips;

a plurality of S-shaped passageways, the S-shaped passageways providing fluid communication between the discharge tips of the impeller and the inlet of the impeller, the S-shaped passageways being adapted to reinject fluid from the discharge tips to the inlet of the impeller, the S-shaped passageways having intake openings near the discharge tips of the impeller adapted to receive fluid so that the momentum of the fluid, as it is expelled from the discharge tips, will carry the fluid directly into the intake openings of the S-shaped passageways, the S-shaped passageways being shaped to redirect the flow if reinjection fluid so that reinjection fluid exits the S-shaped passageways at the inlet of the impeller at a generally small angle of attack with respect to impeller vanes at the inlet, the S-shaped passageways being shaped to redirect the reinjection fluid so that reinjection fluid exits the S-shaped passageways in a direction which has a component opposite to the direction of rotation of the impeller, the S-shaped passageways being arranged in side-by-side relation to form an annular

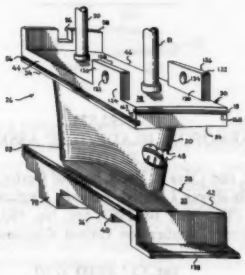
reinjection port to inhibit undesirable fluid flow patterns in the pump.

4,492,517

SEGMENTED INLET NOZZLE FOR GAS TURBINE, AND METHODS OF INSTALLATION

Nicholas Klompas, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 6, 1983, Ser. No. 456,288
Int. Cl.³ F01D *11/00*
U.S. Cl. 415—139 **16 Claims**



1. A nozzle guide vane assembly for a gas turbine engine, said assembly comprising:

a plurality of arcuate nozzle segments elastically joined to each other and forming an annular nozzle ring, each of said nozzle segments including a vane extending between a nozzle segment inner endwall and a nozzle segment outer endwall, the inner and outer endwalls of each nozzle segment having a pair of generally circumferentially-facing edges abutting respective corresponding circumferentially-facing endwall edges of adjacent nozzle segments in sealing relationship to form continuous inner and outer endwall rings;

inner and outer support structures for said nozzle ring;

an inner mounting arrangement mounting said inner endwall ring to said inner support structure, said inner mounting arrangement including means for providing axial retention and for permitting at least free relative radial movement;

an outer mounting arrangement mounting said outer endwall ring to said outer support structure, said outer mounting arrangement including means for permitting at least free relative radial movement;

at least one of said inner and outer mounting arrangements also including means for providing circumferential retention;

each abutting pair of said circumferentially-facing edges including a compressible seal therebetween;

means for applying a compressing force to each of said abutting pairs whereby said compressible seal is compressed to form an effective seal between said abutting pairs;

said means for applying a compressing force including each of said nozzle segments including a flange projecting radially outwardly from said outer endwall adjacent each of said generally circumferentially-facing endwall edges, each of said flanges having a front surface generally parallel to the adjacent endwall edge and abutting a corresponding flange front surface of an adjacent nozzle segment, and each of said flanges having a rear surface, and a generally circumferentially-extending aperture formed in each of said flanges in alignment with a corresponding aperture in the adjacent nozzle segment flange; and

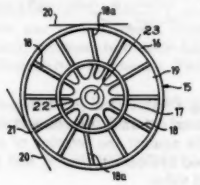
a tie rod extending through said corresponding apertures of each pair of corresponding flanges with extending portions of each tie rod extending away from said corresponding flange rear surface, a pair of sleeves surrounding said extending portions on respective sides of each pair of corresponding flanges with one end of each sleeve bearing against a flange rear surface, and an enlarged portion on each tie rod end bearing against the other end of each sleeve to place said tie rods in tension and said sleeves in compression.

4,492,518

GAS TURBINE ENGINE BEARING SUPPORT STRUCTURE

Peter F. Neal, Castle Donington, England, assignor to Rolls-Royce Limited, London, England

Filed Jan. 11, 1983, Ser. No. 457,234
Claims priority, application United Kingdom, Feb. 12, 1982, 8204170
Int. Cl.³ F01D *25/16*
U.S. Cl. 415—142 **4 Claims**



1. A bearing support structure for a bearing and a shaft of a gas turbine engine, said bearing support structure comprising:

a central hub portion for receiving and coaxially supporting the bearing and the shaft;

a ring member spaced radially outwardly of said central hub portion, said ring member being coaxial with said central hub portion and defining therewith and annulus forming a portion of a gas passage through said gas turbine engine;

and means for receiving and transferring radial loads received by said central hub portion from said bearing and said shaft to said ring member, said means including a plurality of spokes all lying in a plane perpendicular to an axis of said central hub portion, said plurality of spokes interconnecting said central hub portion and said ring portion, a majority of said plurality of spokes extend radially of said axis of said central hub portion and are perpendicular to an imaginary tangent at a point of intersection with said ring member and a remaining minority of said plurality of spokes extend at an incline to an imaginary tangent at a point of intersection with said ring member whereby loading of said inclined spokes promotes limited rotation of said central hub portion relative to said ring member and causes localized bending of said radially extending spokes to partially relieve compressive loads in said radially extending spokes.

4,492,519

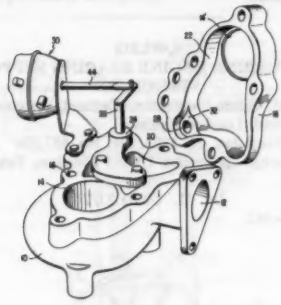
TURBOCHARGER EXHAUST GAS BY-PASS VALVE

Bruce R. Owen, Indianapolis, and R. Charles Sarle, Noblesville, both of Ind., assignors to Wallace Murray Corporation, New York, N.Y.

Filed Feb. 15, 1979, Ser. No. 12,364
Int. Cl.³ F01D *17/00*; F02B *37/00*; F16K *3/04*
U.S. Cl. 415—145 **6 Claims**

1. A turbocharger including a housing having an exhaust inlet and an exhaust gas outlet in the turbine section thereof, the improvement comprising, a by-pass system for diverting exhaust gases around the turbine section, said by-pass system including a by-pass port and passage and a valve within said housing for selectively closing said by-pass port against exhaust gas flow therethrough into said by-pass passage, said valve being in the form of a pivotally mounted valve plate, said

by-pass port opening through a face of said housing, and means mounting said valve plate for sliding movement parallel to said housing face and perpendicular to by-pass exhaust gas flow, whereby said valve plate position between fully opened and fully closed is infinitely variable, said means mounting said



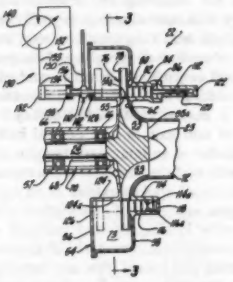
valve including a valve stem extending through an orifice in said housing to an external control, and said valve has a plate portion sealable against the interior of said turbine housing surrounding said orifice for closing said orifice in the closed position of said valve.

4,492,520

MULTI-STAGE VANE STATOR FOR RADIAL INFLOW TURBINE

William C. Marchand, 11339 Roxbury Avenue, Detroit, Mich. 48224

Filed May 10, 1982, Ser. No. 376,327
Int. Cl.³ F01D *1/08*
U.S. Cl. 415—150 **7 Claims**



1. In a turbine engine for driving a vehicle, said turbine engine consisting of a turbine housing having a free turbine wheel rotatably mounted therein, and inlet means for directing a gas radially inwardly towards said free turbine wheel, the improvement comprising:

multi-stage stator vane means, said multi-stage stator vane means having a plurality of stator stages, each respective stator stage of said plurality of stator stages having respective inlet vanes set at a predetermined respective angle of incidence;

mounting means mounting said multi-stage stator vane means to said inlet means for relative movement therebetween;

control means operatively connected to said stator means to selectively locate any of said plurality of stator stages over said inlet means, said control means further comprising shaft means movably interconnected with said turbine housing and power actuated piston cylinder means fixedly interconnected with said shaft means to position said plurality of stator stages relative to said inlet means; and

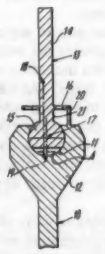
additional housing means provided between said power actuated piston cylinder means and said turbine housing, said additional housing means defining an annulus for the passage of fluid at a higher pressure than said gases in said turbine housing, to thereby provide a heat shield for said power actuated piston cylinder means.

4,492,521

SEALED AEROFOIL BLADE/DISC ASSEMBLY FOR A ROTOR

George Pask, and Clive E. Brett, both of Derby, England, assignors to Rolls-Royce Limited, London, England

Filed May 10, 1983, Ser. No. 493,268
Claims priority, application United Kingdom, Jun. 17, 1982, 8217518
Int. Cl.³ F01D *5/30*
U.S. Cl. 416—193 A **4 Claims**



1. An aerofoil blade/disc assembly for a rotor of a compressor or turbine of a gas turbine engine comprising:

a rotor disc having an axis of rotation, said rotor disc including a circumferential channel opening to a periphery of the same, said circumferential channel having a part circular cross-sectional shape on at least a radially inwardly facing surface of the same;

an annular array of rotor blades mounted on said rotor disc, each blade of said array of rotor blades including an aerofoil cross-section portion and a root portion, said root portion having a part circular cross-sectional shape complimentary to and engaging said part circular cross-sectional shape of said circumferential channel to provide a limited degree of pivotal movement of said blade to said disc about a pivot axis, each said blade having a center of gravity offset relative to a radial plane perpendicular to said axis of rotation of said disc and extending through said pivot axis so that said blade pivots with respect to said disc upon rotation of said disc;

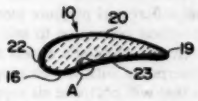
and means operative when said rotor disc is rotating to define a seal between said annular array of rotor blades and said rotor disc, said means including a circumferential radially extending feature provided on the periphery of said disc and a seal portion on each of said blades, said seal portion on each of said blades sealingly engaging with said feature when said disc is rotating and said blades have pivoted.

4,492,522

BLADE FOR A FLUID FLOW ENGINE AND METHOD FOR MANUFACTURING THE BLADE

Axel Rossmann, and Werner Huether, both of Karlsfeld, Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 10, 1982, Ser. No. 448,706
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151413
Int. Cl.³ F01D 5/14
U.S. Cl. 416—241 R 11 Claims



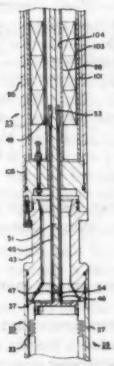
1. A blade for a turbomachine, comprising a blade body of a dense ceramic material and a protective coating on at least certain surface portions of said blade body, said protective coating being selected from the group consisting of titanium nitride, titanium carbide and titanium carbon nitride, said protective coating having been applied by chemical vapor deposition (CVD) or physical vapor deposition (PVD), whereby said blade has an improved resistance to both corrosion and erosion as compared to said blade without said protective coating.

4,492,523

TOROIDAL INDUCTOR FOR A PRESSURE SENSOR IN A SUBMERSIBLE PUMP

Dick L. Knox, Claremore, Okla., assignor to Hughes Tool Company, Houston, Tex.

Filed Feb. 10, 1984, Ser. No. 579,045
Int. Cl.³ F04B 49/02, 49/10, 35/04
U.S. Cl. 417—13 3 Claims



1. A submersible pump assembly, comprising in combination:

a pump;

an electrical motor located below the pump and having a drive shaft for rotating the pump, the motor being filled with lubricant;

a sensor housing carried by the motor below the motor;

at least one inductor located in the sensor housing and connected between a transducer for measuring a physical parameter and a winding of the motor, for shielding AC power from the transducer, the inductor having a toroidal configuration with an aperture therethrough, defining a longitudinal passage;

a pressure compensator carried by the motor below the motor and in communication with lubricant of the motor;

a bellows located in the pressure compensator housing, separating lubricant from well fluid, the bellows having an end and an axially expansible sidewall that allows the end to move between an upper position and a lower position to reduce pressure differential between lubricant and well fluid; and

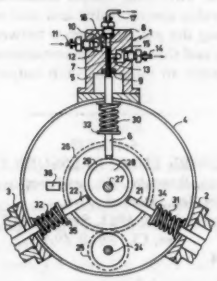
retaining means for mechanically preventing the end of the bellows from moving to the lower position while lowering the pump assembly in the well, and for releasing the pressure compensator for free movement during operation of the motor, the retaining means including an elongated member that engages the end of the bellows and passes through the longitudinal passage of the inductor.

4,492,524

MULTIPLE PISTON PUMP WITH A CONSTANT DISCHARGE CAPACITY

Dieter Koch, Ettlingen, and Tonio Gianotti, Weinheim, both of Fed. Rep. of Germany, assignors to Bruker-Analytische Messtechnik GmbH, Rheinstetten-Forchheim, Fed. Rep. of Germany

Filed Sep. 17, 1981, Ser. No. 303,057
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1980, 3035770
Int. Cl.³ F04B 49/06, 49/08
U.S. Cl. 417—18 19 Claims



1. A multiple piston pump with a constant discharge capacity for liquid chromotography,

said pump comprising at least three piston-cylinder units having their individual liquid discharge outlets connected to a common liquid discharge outlet,

a single electric stepping motor providing the motive power for operating all of said piston-cylinder units,

a single circular eccentric rotatable drive cam operable by said motor for operating all of said piston-cylinder units,

said circular eccentric rotatable drive cam having a rotary cycle in which said piston-cylinder units are operated in sequence with equal phase displacement intervals therebetween of 360° divided by the number of piston-cylinder units,

said circular eccentric drive cam affording a non-linear relationship between the rotary speed of said motor and the linear speed of each piston-cylinder unit during its pumping stroke,

a pressure transducer for producing an electrical signal corresponding to the pressure in said common discharge outlet,

said piston-cylinder units producing a combined liquid discharge tending to have pressure pulsations therein at said common liquid discharge outlet,

and an electronic control system connected between said pressure transducer and said stepping motor for regulating the instantaneous speed of said motor to maintain at least

approximately constant outlet discharge pressure and thereby to maintain at least approximately constant discharge capacity,

said electronic control system having fast response regulating means for rapidly changing the speed of said motor in response to outlet pressure pulsations during each cycle of said circular eccentric drive cam so as to minimize said pulsations and thereby compensate for the non-linear character of said drive cam so as to maintain the outlet pressure at least approximately constant during each cycle of said drive cam,

said fast response regulating means including a high-pass filter for receiving and passing the pulsations in the pressure signals from said pressure transducer while withholding any substantial transmission of long term changes in the pressure signals,

means for supplying a reference direct voltage,

a summing stage for receiving the pulsating signals from said high-pass filter and for superimposing said pulsating signals upon said reference direct voltage to produce combined output signals,

a threshold value discriminator connected to said summing stage for receiving said combined output signals,

pulse generating means connected to said stepping motor for producing pulses to operate said stepping motor at a speed corresponding to the frequency of said pulses,

said pulse generating means including switchable pulse frequency changing means for switching the pulse frequency between a higher value and a lower value,

and electronic switching means connected between said threshold value discriminator and said switchable means for switching the pulse frequency between its two values to speed up and slow down the instantaneous speed of said stepping motor to minimize such output pressure pulsations.

4,492,525

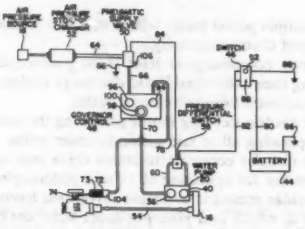
PNEUMATIC FIRE PUMP PRESSURE CONTROLLER

Delford D. Bilyeu, Roanoke, Va., assignor to Grumman Emergency Products, Inc., Roanoke, Va.

Filed Feb. 18, 1983, Ser. No. 467,599

Int. Cl.³ F04B 49/00

U.S. Cl. 417—34 **4 Claims**



1. An electro-pneumatic fire pump pressure controller which controller comprises:

an air pressure supply means;

an electrical supply means;

a water supply means;

a pump means connected to said water supply means, said pump means having discharge means for delivery of water under pressure;

a powerplant means connected to said pump means to drive same, said powerplant means having a control means to regulate the powerplant means rpm and thereby the pump means rpm, said control means being biased towards an idle position to maintain a minimum powerplant means rpm when no flow is scheduled by said pump means, said control means being connected to said air pressure supply means;

modulating means interposed in the connection of said control means and said air supply means to operate the said control means with air pressure from said air pressure supply mean;

a differential pressure means connected between said water supply means and said discharge means, said differential pressure means including electrical circuit breaker means that is normally open when said water under pressure at said discharge means is below a predetermined pressure and closed when above said predetermined pressure;

a first switch means connected to said electrical supply means and said differential pressure means;

a second switch means connected to said differential pressure means, said second switch means having a solenoid valve means interposed with said air supply and said modulating means that will port said air supply means to said modulating means upon closure of the electrical circuit breaker of said differential pressure means for actuation of said control means and exhaust said air supply means from said control means when said electrical circuit breaker opens.

4,492,526

COMPRESSOR DRIVE SYSTEM

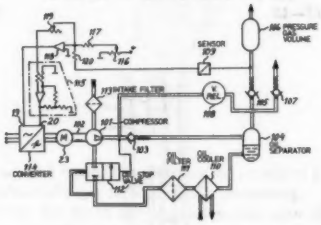
Carl S. M. Hartwig, Täby, Sweden, and Ludovicus J. van Nederkassel, Buggenhout, Belgium, assignors to Institut Cerac S.A., Ecublens, Switzerland

Filed Nov. 26, 1982, Ser. No. 444,827

Claims priority, application Switzerland, Dec. 18, 1981, 8098/81

Int. Cl.³ F04B 49/06

U.S. Cl. 417—45 **3 Claims**



1. A compressor drive system for controlling the gas pressure in a pressure gas volume connected to the compressor comprising:

a compressor,

a brushless alternating current motor for driving said compressor, and

pressure sensing means connected to said gas volume for sensing the gas pressure therein,

the improvement comprising said compressor being directly coupled to said motor for driving said compressor with the same speed as the motor,

a converter means for supplying said motor with a drive voltage of variable amplitude and frequency,

said pressure sensing means being connected to the converter to simultaneously change the amplitude and frequency of said drive voltage in a direction opposite to the direction of change of pressure of the pressure in said gas volume, and

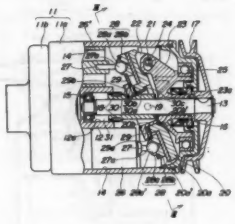
means for controlling the amplitude and frequency of said drive voltage so that the current at normal speed maximum load of the motor is never exceeded during motor start.

4,492,527

WOBBLE PLATE PISTON PUMP

James C. Swain, and David L. Thomas, both of Columbus, Ohio, assignors to Diesel Kiki Co., Ltd. (Japanese Corp.), Tokyo, Japan

Filed Feb. 17, 1983, Ser. No. 467,413
Int. Cl.³ F04B 1/26
U.S. Cl. 417—222 6 Claims



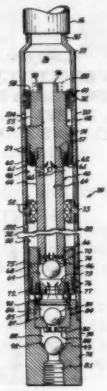
1. In a wobble plate piston pump including a housing a drive shaft rotatably mounted in said housing, a cylinder block fixedly disposed in said housing and formed therein with a plurality of cylinders circumferentially arranged around said drive shaft and extending substantially parallel to the axis of said drive shaft pistons received in said cylinders for reciprocating motions therein, piston rods secured integrally to said pistons, a wobble plate having a central through bore through which said drive shaft extends, said wobble plate being rotatable in unison with rotation of said drive shaft and tiltable relative to said drive shaft, slipper shoes each having a flanged portion disposed in slidable contact or close proximity with a side surface of said wobble plate and a trunk portion engaging a corresponding one of said piston rods, and means for holding said slipper shoes in slidable contact or close proximity with said wobble plate, the improvement comprising in said slipper shoe holding means: a first retainer member in the form of an annular plate and substantially flat over whole side surfaces thereof, said first retainer member having a first through bore formed in a central portion thereof, and a plurality of second through bores circumferentially arranged in the vicinity of an outer periphery thereof, each being slightly larger in diameter than said trunk portions of said slipper shoes, said first retainer member being loosely fitted at said first through bore on said drive shaft, said second through bores loosely receiving therethrough respective ones of said trunk portions of said slipper shoes; a second retainer member having an axially extending tubular portion loosely fitted through said first through bore in said first retainer member and unremovably fitted in said central through bore of said wobble plate, said tubular portion being smaller in diameter than said first through bore in said first retainer member to provide a radial space between said first and second retainer members, and a radially flanged portion formed integrally with said tubular portion and having an outer diameter substantially larger than that of said first through bore of said first retainer member but so small that said flanged portion of said second retainer member does not interfere with the sliding movement of said slipper shoes on said wobble plate, said flanged portion of said second retainer member being disposed to slide on an inner fringe portion of said first retainer member encircling said first through bore in a manner permitting radial and circumferential movements of said first retainer member in said radial space; and means for holding said second retainer member at a predetermined axial location relative to said wobble plate, said first retainer member being held at said inner fringe portion thereof in slidable contact with said flanged portion of said second retainer member by said second retainer member holding means so that said first retainer member is held in slidable contact or close proximity with said flanged portions of said slipper shoes to keep said flanged portions of said slipper shoes in slidable contact or close proximity with said sliding side surface of said wobble plate, whereby during rotation of said wobble plate, said first retainer member is movable in unison with the sliding movement of said slipper shoes, in directions radial and circumferential relative to said wobble plate and substantially parallel to said sliding side surface of said wobble plate.

4,492,528

PRESSURE BALANCED LIQUID ELEVATING MECHANISM

Arthur P. Bentley, P.O. Box 6791, Great Falls, Mont. 59406

Filed Apr. 6, 1983, Ser. No. 482,490
Int. Cl.³ F04F 7/00; F04B 35/02
U.S. Cl. 417—241 17 Claims



1. A liquid elevating mechanism for use with pumps of the type having a generator which produces cyclic pressure waves for transmission through a column of liquid to said mechanism for liquid elevating operation thereof, said liquid elevating mechanism comprising:

(a) a housing having a bore the upper end of which is for communication with the liquid column of the pump and having a liquid intake opening in the lower end thereof for communication with a liquid to be pumped;

(b) a plunger reciprocally movable in the bore of said housing for impingingly receiving the transmitted pressure waves and responding thereto by reciprocally moving, said plunger having an axial passage;

(c) check valve means in the liquid intake opening of said housing to allow the liquid to be pumped to flow into the lower end of the bore of said housing when said plunger moves upwardly therein;

(d) check valve means in the axial passage of said plunger to allow the liquid in the lower end of the bore of said housing to move into the axial passage of said plunger upon downward movement thereof;

(e) means for utilizing the head pressure force of the liquid column of the pump for counterbalancingly biasing said plunger upwardly with a force which is greater than the downwardly directed head pressure force but is less than the downwardly directed head pressure force plus the weight of the plunger so that said plunger is normally in the down position of its reciprocal stroke and will be moved up when the force of a received pressure wave is added to the counterbalancing biasing force, said means including,

I. a counterbalancing piston on the upper end of said plunger,

II. means in said plunger for placing the opposite end surfaces of said counterbalancing piston in communica-

tion with the head pressure force of the liquid column of the pump,

III. said counterbalancing piston having its downwardly facing end surface of larger surface area than the upwardly facing end surface theeof; and

(f) said plunger further including means for adjusting the weight thereof to compensate for different head pressure values of different lengths of the liquid column of the pump.

4,492,529

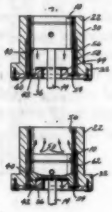
COMPRESSORS EFFICIENCY IMPROVEMENT

Robert B. Grisbrook, 594 Gederson La., Kirkwood, Mo. 63122

Filed Jun. 21, 1982, Ser. No. 390,385

Int. Cl.³ F04B *25/00, 39/10*

U.S. Cl. 417—242 **8 Claims**



1. A reciprocating compressor for use with a reciprocating compressor including a cylinder head, a cylinder and a skirt piston driven reciprocally therein by a crankshaft and connecting rod for compressing air or other gases by displacement within a space above said piston by alternate intake and compression strokes, an efficiency improvement device installed within the cylinder and defining an annular recess proximate the side walls of the cylinder below said piston, said recess being shaped complementarily to said piston skirt for providing a closely fitted relationship with, and being oriented relative to, said piston for receiving at least a portion of the skirt of said piston during its intake stroke for compressing of gas in said recess, said device being of flange-like configuration and including a flange portion extending laterally inwardly from the walls of said cylinder and carrying a central annular boss extending upward toward said piston for defining between said boss and the cylinder walls said annular recess, and means defining at least one passage between said recess and the space between said piston and cylinder head for causing gas compressed in said recess to be provided under pressure to said head space for increasing the initial charge of gas within said head space for compression by said piston during its compression stroke, thereby to increase the efficiency of the compressor said flange portion defining a central opening therein for said connecting rod, said boss including seal means for providing a sealing relationship between said boss and inner surfaces of said piston skirt for preventing gas in said recess from escaping around said boss as said skirt is received in said recess, said central opening having relatively larger diameter than corresponding dimensions of said connecting rod and whereby there is not provided a sealing relationship between said connecting rod and said device, and whereby there is no interference with movement of said connecting rod.

4,492,530

COMPRESSOR UNIT

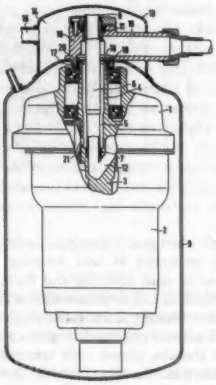
Siegfried Schüwald, Bad Neustadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 18, 1982, Ser. No. 379,444

Claims priority, application Fed. Rep. of Germany, May 25, 1981, 3120730

Int. Cl.³ F04B *35/04*

U.S. Cl. 417—271 **3 Claims**



1. In a compressor unit comprising a housing, a radial piston compressor and a drive motor for the piston compressor, the piston compressor and the drive motor being disposed about and supported by a stationary shaft suspended in the unit housing, the improvement comprising the stationary shaft being hollow at its end adjacent the piston compressor and defining a cavity thereat, a flexible support member having one end protruding into said cavity connected to the shaft therein and another end fastened to the housing to flexibly couple the stationary shaft to the housing, the stationary shaft, and the piston compressor and the drive motor supported by the shaft, being arranged in the housing to swing freely therein upon flexing of the flexible support member.

4,492,531

APPARATUS FOR PRODUCING A CONTROLLED PULSED LIQUID FLOW

Kubota Kenji, Okayama; Fukunaga Kouji, Kurashiki; Kirita Yasuzo, Toyonaka, and Naito Hidemune, Kobe, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Apr. 21, 1983, Ser. No. 487,212

Claims priority, application Japan, Apr. 30, 1982, 57-74169

Int. Cl.³ F04B *49/00, 43/12;* A61M *1/03;* B01D *13/00*

U.S. Cl. 417—279 **6 Claims**

1. Apparatus for producing a controlled pulsed liquid flow comprising:

a roller pump for pumping a liquid;

a conduit coupled to the output of said pump for providing a liquid flow path;

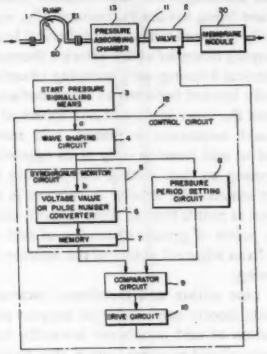
a normally open valve coupled to said flow path for closing the flow path in response to a close-valve signal;

start-pressure signalling means operatively associated with said pump for intermittently issuing a start-pressure signal;

synchronous monitor circuit means for generating a voltage value or pulse number representative of the period of said start-pressure signal;

pressure-period setting circuit means for generating a time varying signal in accordance with a desired pressure-period setting and in correlation with the period of said start-pressure signal; and

comparator circuit means coupled to said synchronous monitor circuit means and said pressure-period setting circuit means for comparing said time varying signal to the voltage value or pulse number generated by said synchronous



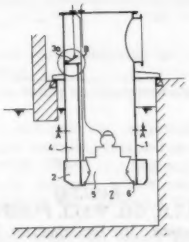
monitor circuit means, and producing a close-valve signal commencing with the issuance of said start-pressure signal and terminating when the value of said time varying signal concurs with said voltage value or pulse number.

4,492,532

SHAFT PIPE CONSTRUCTION FOR REGULATING LIQUID DELIVERY OF SUBMERSIBLE PUMPS

Janos Csemniczky, and Istvan Jozsa, both of Budapest, Hungary, assignors to Ganz-Mavag Mozdony-Vagon-és Gépgyar, Hungary

Filed Jun. 8, 1982, Ser. No. 386,344
Claims priority, application Hungary, Jun. 19, 1981, 1820/81
Int. Cl.³ F04B *23/02;* **F04D** *5/00*
U.S. Cl. 417—360 **5 Claims**



1. A submersible pump system for pumping liquids, comprising:

a shaft tube having a lower inlet at a lower end thereof and adapted to have its lower inlet immersed in a liquid;

a liquid rotating case connected at the lower end of said shaft tube, having an outlet adjacent said lower inlet of said tube and an upper inlet for receiving liquid;

a submersible pump supported in said tube at the lower end of said tube, adjacent said lower inlet of said tube, said pump having an inlet adjacent said lower inlet of said tube for receiving liquid, and an upper outlet for discharging liquid into said tube;

a vertical return passage connected between said rotating case upper inlet and a portion of said shaft tube above said pump outlet; and

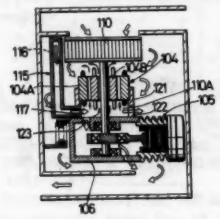
a regulating throttle disposed in said return passage for regulating a flow of liquid from said portion of said shaft tube to said rotating case.

4,492,533

AIR COMPRESSOR

Kazuo Tsuge, Yokohama, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Continuation of Ser. No. 272,266, Jun. 10, 1981,. This application May 9, 1984, Ser. No. 608,537
Claims priority, application Japan, Jun. 17, 1980, 55-85431[U]; Oct. 20, 1980, 55-149503; Dec. 18, 1980, 55-182564
Int. Cl.³ F04B *39/06, 35/04*
U.S. Cl. 417—372 **2 Claims**



1. An air compressor, comprising:

a compressor unit;

a drive unit having a drive shaft for driving said compressor unit;

a circular cylindrical sound insulating box having a longitudinal axis extending parallel to said drive shaft, said box having an air inlet and an outlet and encasing said compressor and drive units;

a fan mounted on said drive shaft and positioned eccentrically from said axis of said sound insulating box and sucking air axially from said air inlet to supply cooling air to the interior of said sound insulating box from the outer periphery thereof;

a duct mounted in said sound insulating box at a position where an outer periphery of said fan most closely approaches an inner peripheral wall of said sound insulating box;

an inlet of said duct opening between the outer periphery of said fan and inner peripheral wall of said sound insulating box;

an outlet of said duct opening to the interior of at least one of said drive unit and said compressor unit; and

a chamber providing communication between said drive unit and compressor unit.

4,492,534

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINE

Masahiko Miyaki, Oobu; Akira Masuda, and Toshimi Matsumura, both of Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 4, 1983, Ser. No. 538,994
Claims priority, application Japan, Oct. 5, 1982, 57-175665
Int. Cl.³ F04B *35/02, 19/02;* **F02M** *39/00*
U.S. Cl. 417—386 **6 Claims**

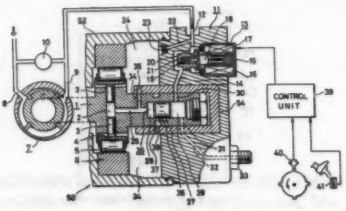
1. A fuel injection pump of a fuel injection system of the type arranged to control the amount of fuel injected into engine cylinders by using an electromagnetic valve, comprising:

(a) a rotor arranged to rotate in synchronism with engine rotation, and having a radial bore and an axial bore communicating with each other, said rotor being rotatably mounted in said fuel injection pump;

(b) an inner cam mechanism having a pair of plungers movably received in said radial bore of said rotor, said plungers being arranged to reciprocate as said rotor rotates to compress fuel between said plungers;

(c) a shuttle axially movable within said axial bore of said rotor, defining first and second chambers within said axial bore;

(d) main fuel intake port means communicable with said first chamber for supplyng fuel thereto when said electromagnetic valve is open, said fuel in said first chamber being compressed when said shuttle moves in a direction from said second chamber toward said first chamber;
(e) a low pressure fuel reservoir for receiving fuel therein, wherein the fuel pressure is lower than that of the fuel in said main fuel intake port means;
(f) auxiliary fuel intake port means for establishing communication between said low pressure fuel reservoir and said



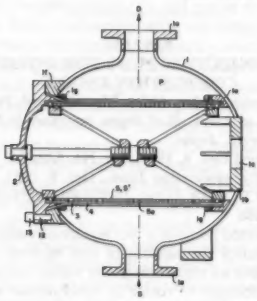
axial bore and said second chamber when said rotor assumes predetermined angles;
(g) a by-pass means communicable with said second chamber when said shuttle has been moved toward said first chamber with the fuel pressure within said second chamber being increased by the movement of said plungers, said by-pass communicating with said low pressure fuel reservoir; and
(h) fuel distribution passage means communicable with said first chamber for injecting pressured fuel into engine cylinders one after another.

4,492,535

DIAPHRAGM PUMP

Friedrich R. R. Stahlkopf, Büchen, Fed. Rep. of Germany, assignor to Otto Tuchenhagen GmbH & Co. KG, Büchen, Fed. Rep. of Germany

Continuation of Ser. No. 263,745, May 14, 1981, abandoned. This application Feb. 1, 1984, Ser. No. 575,490
Claims priority, application Fed. Rep. of Germany, May 31, 1980, 3020775
Int. Cl.³ F04B *43/08*
U.S. Cl. 417—394 **22 Claims**



1. A hydraulically-actuated, reciprocating diaphragm pump comprising:
inlet means defining a suction opening for receiving fluid to be pumped;
a spherical housing connected to said inlet means for receiving in a pumping chamber defined therein the fluid to be pumped;
an elongated cylindrical, tubular, generally hose-shaped membrane located in the interior of said spherical housing, said membrane being pulsed by pulsating pressure from a pressure source to pump said fluid being pumped through the pumping chamber of said spherical housing by expansion and contraction of said member when pulsed, said membrane being vertically, horizontally, and axially symmetrically disposed within said spherical housing to define the pumping chamber at the exterior thereof and inside of the spherical housing, said pumping chamber being symmetrically located between an inner surface of said membrane and the inner surface of said spherical housing, even when said membrane is pulsed, said membrane being clamped to said housing only at its opposite ends within said housing so that, during the pressure stroke of said pressure source, the tubular membrane is symmetrically deformed at points remote from its both clamped ends so that the points of greater distension of said membrane are remote from adjacent points of the interior of said spherical housing;
a support pipe within said membrane located so that said membrane closely surrounds said support pipe to prevent deformation of said membrane inwardly during the suction stroke of said pressure source, thus to avoid compressive strain on said membrane; and
outlet means defining a discharge opening axially aligned with said suction opening and located opposite said suction opening on said spherical housing, said membrane comprising an inner cylindrical hose membrane and an outer cylindrical hose membrane provided about said support pipe, the outer membrane sheathing the inner membrane concentrically and without space between them, said pump being further characterized in that the inner and outer hose membranes at their rear ends are clamped together while the inner hose membrane at its frontal end is clamped in tight material contact between a rear acceptance ring and a cover at the outer side and a divided or radially stretchable ring at the inner side, a conical tension ring being axially movable toward the center of the spherical housing and arranged in a respective intermediate ring.

4,492,536

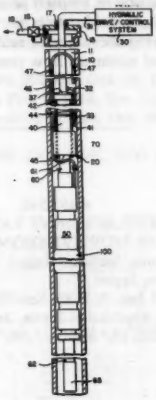
HYDRAULIC OIL WELL PUMPING UNIT

Thomas A. Gilbertson, 216 Sandringham, N., Moraga, Calif. 94556

Continuation of Ser. No. 271,592, Jun. 8, 1981, abandoned. This application Jul. 15, 1983, Ser. No. 513,948
Int. Cl.³ F04B *47/08*
U.S. Cl. 417—401 **14 Claims**

1. An oil well pump unit adapted to be mounted within an oil producing zone of an oil well bore hole and comprising a pump barrel in the form of an elongated section of pipe; an elongated pump rod adapted to be received within and to traverse said pump barrel; an integral pump rod seal and check valve assembly mounted on top of said pump barrel and including means for receiving said pump rod in a sliding seal engagement to permit said pump rod to enter said pump barrel; said pump rod seal and check valve assembly further including a valve bypass channel extending between a fluid passageway above said check valve and said pump barrel; said pump rod having at least one flat edge surface formed at a bottom end thereof and being adapted to communicate with said valve bypass channel

when said pump rod is at the end of its upstroke so as to permit well fluid above said check valve to enter said pump barrel



through said bypass and thereby to displace any gas within said pump barrel.

4,492,537

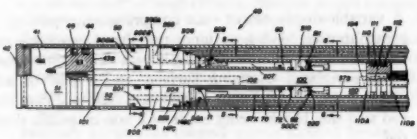
FLUID-OPERATED OIL OR WATER WELL PUMP

John B. Awerkamp, 720 N. 2nd St., Quincy, Ill. 62301

Filed Dec. 10, 1982, Ser. No. 448,719

Int. Cl.³ F04B *47/08*

U.S. Cl. 417—404 **21 Claims**



1. A fluid operated pump adaptable for use in a vertical orientation comprising:

an outer housing including a closure mounted adjacent a first end thereof;

a rod operatively mounted for reciprocation within said outer housing and including first and second ends;

a first piston member affixed to a first end of said rod and being operatively disposed within said outer housing adjacent said closure and defining a first fluid chamber therebetween;

a first casing being positioned within said outer housing adjacent to said piston member and defining a second fluid chamber therebetween;

a second casing being positioned at a predetermined distance from said first casing and defining a chamber between said outer housing and said first and second casings;

a plurality of tubes having inner and outer surfaces being disposed within said chamber and defining a plurality of fluid passages between said inner and outer surfaces and said first and second casings;

a third and fourth casing being positioned at a predetermined distance within an inner tube of said plurality of tubes being disposed in said chamber and defining a working pump chamber therebetween;

a second piston member being affixed to said rod and being operatively disposed within said working pump chamber;

an inlet conduit being in communication with one of said plurality of fluid passages for supplying fluid to said working pump chamber;

an outlet conduit being in communication with one of said plurality of fluid passages for discharging fluid from said working pump chamber;

pressurized fluid being in communication with at least one of said plurality of fluid passages for selectively supplying fluid to said first and second fluid chambers to impart movement to said first piston member;

whereby selectively supplying pressurized fluid to said first and second fluid chambers imparts reciprocation to said first piston member which imparts reciprocation to said rod and said second piston member for supplying fluid to said working pump chamber and simultaneously discharging fluid therefrom.

4,492,538

SQUEEZE PUMP

Noboru Iwata, Gifu, Japan, assignor to Daiichi Engineering Co., Ltd., Gifu, Japan

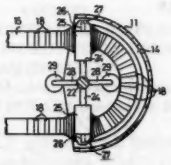
PCT No. PCT/JP81/00364, § 371 Date Aug. 2, 1982, § 102(e) Date Aug. 2, 1982, PCT Pub. No. WO82/02075, PCT Pub. Date Jun. 24, 1982

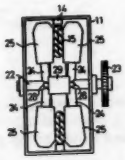
PCT Filed Dec. 3, 1981, Ser. No. 440,214

Claims priority, application Japan, Dec. 13, 1980, 55/176235; Mar. 25, 1981, 56/44490; Jul. 6, 1981, 56/105354; Jul. 23, 1981, 56/116270

Int. Cl.³ F04B *43/12, 45/08*

U.S. Cl. 417—477 **3 Claims**





1. A squeeze pump comprising

a semi-circular casing,

a resilient tube situated along the inside of the semi-circular casing so that the direction of the tube is changed along the semi-circular portion of the casing, said tube including a plurality of grooves on the outer periphery so that the resilient tube is bent easily when pressure is applied thereto, material to be transferred passing through the resilient tube,

a rotary arbor rotationally situated in the casing, said arbor being disposed equidistantly away from the curved portion of the resilient tube and adapted to be rotated by power means,

at least one pair of means for pressing the resilient tube connected to the arbor, each pressing means including a support shaft extending outwardly from the arbor, and a presser roll rotationally connected to the support shaft and having a main body with a tapered head, said main body being frusto-conical with the diameter increasing towards the outer end thereof, the diameter D of the presser roll at the radially outer point thereof clamping the radially outer portion of the tube and the diameter d of

the presser roll at the radially inner point clamping the radially inner portion of the tube being defined by $D=2R/n$, $d=2r/n$, wherein R, r denote the distances from the axis of the rotary arbor to said outer and inner points respectively, and n denotes the number of revolutions that the presser roll may rotate about its own axis without slipping when the rotary arbor performs one complete rotation, two pressing means facing each other so the innermost tangential planes on the main bodies facing each other are parallel and are spaced apart at a distance about twice as great as the thickness of the wall of the resilient tube, said pressing means, when the rotary arbor is rotated, at first nipping the tube by means of the tapered heads and then pressing the tube completely by means of the main bodies, and

at least one auxiliary support shaft connected to the arbor, said auxiliary support shaft having a restoration roll rotationally connected thereto, said restoration roll being situated adjacent to the resilient tube so that after the tube is pressed by the presser rolls, the tube is urged by the restoration roll to return to its undistorted configuration.

4,492,539

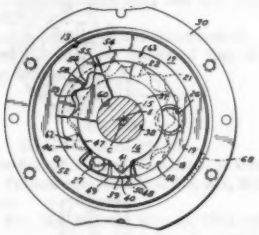
VARIABLE DISPLACEMENT GEROTOR PUMP

Victor J. Specht, 197 S. Saginaw St., Pontiac, Mich. 48058

Continuation-in-part of Ser. No. 250,341, Apr. 2, 1981, Pat. No. 4,413,960. This application Jan. 21, 1983, Ser. No. 459,957

Int. Cl.³ F04C 2/10, 15/04

U.S. Cl. 418—19 **20 Claims**



1. In a variable displacement gerotor pump comprising:

a housing having a bore and a cover at one end;

a fluid inlet port and a fluid outlet port opening into the bore of the housing;

a commutator member having an annular portion with a first crossover element extending radially outwardly from the annular portion, said commutator member with said first crossover element being located between the fluid inlet port on one side and the fluid outlet port on an opposite side;

a variator member in said housing having a first inner surface centered relative to said bore and having a second crossover element extending radially inwardly from the first inner surface, and a second inner surface axially adjacent said first inner surface and being eccentric relative to the bore with the central axis of the second inner surface being offset from the central axis of the bore away from said second crossover element;

means for fixing one of said members to said housing;

said first crossover element engaging said first inner surface of the variator member and the second crossover element engaging said annular portion of the commutator member to separate the fluid inlet and outlet ports;

control means for arcuately shifting and thereby moving the other of said members from a maximum flow position to a minimum flow position;

a gerotor adapted to nest within the second inner surface of said variator member; and

a drive shaft secured to the gerotor and being effective to rotate the gerotor for drawing a fluid through the fluid inlet port on said one side of the first crossover element and discharging said fluid through the fluid outlet port on said opposite side of the first crossover element whereby displacement of said pump is varied by shifting and thereby moving the other of said members between the maximum and minimum flow positions.

4,492,540

VARIABLE-DISPLACEMENT VANE COMPRESSOR WITH ONE OR MORE FERROMAGNETIC VANES

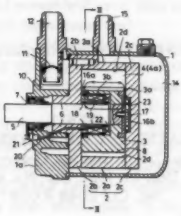
Katsuichi Yamamoto, Saitama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1983, Ser. No. 500,624

Claims priority, application Japan, Jun. 14, 1982, 57-101775

Int. Cl.³ F04C 18/00, 29/10

U.S. Cl. 418—23 **4 Claims**



1. A variable-displacement vane compressor comprising:

a pump housing having an inner peripheral camming surface, said pump housing having a cam ring defining said inner peripheral camming surface, and a pair of side blocks joined to axial ends of said cam ring, said cam ring and said side blocks being made of a non-magnetic material;

a drive shaft rotatably journalled in said pump housing, said drive shaft being made of a ferromagnetic material;

a cylindrical rotor mounted on said drive shaft and disposed in said pump housing, said cylindrical rotor being made of a non-magnetic material, said pump housing and said cylindrical rotor defining at least one pump working chamber therebetween, said cylindrical rotor having a plurality of axial slits spaced circumferentially and a plurality of vanes movably fitted in respective ones of said axial slits and having radially outward ends slidable against said inner peripheral camming surface in response to rotation of said cylindrical rotor for compressing a fluid in a variable-volume chamber in said pump working chamber which is defined by adjacent ones of said vanes, said inner peripheral camming surface and said cylindrical rotor, said plurality of vanes being divided into a first group made of a ferromagnetic material and a second group made of a non-magnetic material, and said cylindrical rotor having a recess coaxial with said drive shaft; and

an electromagnetic coil accommodated in said recess of said cylindrical rotor in a stationary manner and disposed around said drive shaft, said electromagnetic coil being controllably energizable and de-energizable for maintaining said first group of said vanes in and out of sliding contact with said inner peripheral camming surface, whereby the volume of the compressed fluid can be discharged in a variable volume from said pump working chamber.

4,492,541
ROTARY ELECTROHYDRAULIC DEVICE WITH AXIALLY SLIDING VANES

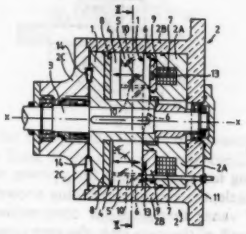
José Mallen-Herrero, Paris; Daniel Leroy, Limay; Urs Zimmermann, Le Chesnay, and Patrice Charlat, Mantes, all of France, assignors to Compagnie de Construction Mecanique Sulzer, Paris

Continuation of Ser. No. 201,935, Oct. 29, 1980, abandoned. This application Feb. 6, 1984, Ser. No. 576,798

Claims priority, application France, Oct. 30, 1979, 79 26873; Jan. 24, 1980, 80 01502

Int. Cl.³ F03C *2/00;* **F04C** *2/00, 15/04*

U.S. Cl. 418—23 **2 Claims**



1. A rotary electrohydraulic device of the volumetrical pump type comprising

a stator and a rotor,

axially sliding vanes of magnetizable material in said rotor, said stator including

a continuous stator bottom surface of a constant width with said vanes bearing constantly and totally on said continuous bottom surface,

an amagnetic stator member,

a yoke member of magnetizable material in said amagnetic stator member,

electromagnetic means located behind said continuous stator bottom surface in said yoke member to control said vanes to enable said vanes to rest on said continuous stator bottom surface during rotation of said rotor, and

auxiliary permanent magnet means located beneath said continuous stator bottom surface to assist in maintaining said vanes suitably applied at any moment against said surface.

4,492,542
GLOBAL WORM MACHINE WITH SEIZURE-PREVENTING CELLS

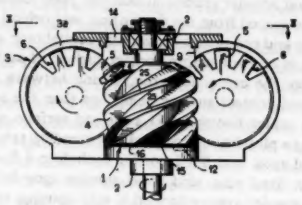
Bernard Zimmern, 27 rue Delabordére, 92200 Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 381,566, May 24, 1982, Pat. No. 4,470,777. This application Dec. 9, 1982, Ser. No. 448,073

Int. Cl.³ F04C *18/12, 29/00*

U.S. Cl. 418—46 **3 Claims**

1. A volumetric machine for compressing, pumping or expanding a fluid, comprising a casing, a screw having screw threads defining crests and grooves, said screw being rotatable in said casing on an axis of rotation, said casing and the crests of said screw threads carrying two cooperating surfaces for establishing between said screw and said casing a substantially fluid-tight relationship as a result of the mutual proximity of said cooperating surfaces, at least one pinion-wheel which is disposed in a passageway within the casing and the teeth of which are adapted to engage with the screw grooves, at least one low-pressure port located at one end of the screw and at least one high-pressure port located at the other end of the screw and separated from the pinion-wheel passageway by a casing zone of predetermined width, wherein at least part of one of the two cooperating surfaces respectively of the casing and of the screw comprises lands defining continuity of said one surface, but being discontinued along any circle centered on the axis of the screw and wherein said lands separate cells from each other, the periphery of each cell being capable of intersection simultaneously by at most only one of the two edges of any of said thread crests, the cells being arranged in



rows separated from each other by lands forming an angle with a plane perpendicular to the axis of the screw, and some at least one the lands being arranged in at least two groups of parallel rows, the rows of one group intersecting with the rows of the other group, the rows of both groups forming an angle with a plane perpendicular to the axis of the screw.

4,492,543
ORBITING MEMBER FLUID DISPLACEMENT APPARATUS WITH ROTATION PREVENTING MECHANISM

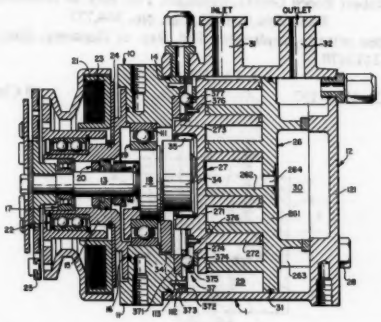
Takayuki Iimori; Kiyoshi Terauchi, both of Isesaki, and Seiichi Sakamoto, Gunma, all of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Mar. 9, 1982, Ser. No. 356,647

Claims priority, application Japan, Mar. 9, 1981, 56-33644

Int. Cl.³ F01C *1/02, 21/02;* **F16D** *3/16;* **F16C** *19/16*

U.S. Cl. 418—55 **7 Claims**



1. In an orbiting member fluid displacement apparatus including a housing, a fixed member attached to or integral with said housing, an orbiting member having an end plate from which an orbiting fluid displacement member extends, said fixed member and orbiting fluid displacement member interfitting at a radial offset to make a line contact to separate a fluid outlet from a fluid inlet and a driving mechanism including a rotatable drive shaft connected to said orbiting member to drive said orbiting member in an orbital motion, rotation preventing/thrust bearing means connected to said orbiting member for preventing the rotation of said orbiting member and for carrying axial thrust load from said orbital member during orbital motion so that the line contact moves toward a discharge opening, said rotation preventing/thrust bearing means being comprised of a discrete orbital portion, a discrete fixed

portion and bearing elements coupled between said portions, a center line extending through the center of said bearing elements, said orbital portion including an orbital annular race and an orbital ring, said orbital annular race being placed within an annular groove formed in said end plate on an opposite side from which said orbiting fluid displacement member extends, said annular groove in said end plate having an axial end surface spaced from the center line, said orbital ring being attached to said end plate to cover said orbital race, said orbital ring being in contact with a contact surface of said end plate spaced from the center line, the spacing between the center line and said contact surface being less than the spacing between the center line and said axial end surface, said orbital ring having a plurality of first pockets extending axially toward said orbital race, said fixed portion including a fixed annular race and a fixed ring, said fixed annular race being placed within an annular groove formed in said housing, said annular groove in said housing having an axial end surface spaced from the center line, said fixed ring being attached to said housing to cover said fixed race and facing said orbital ring, said fixed ring being in contact with a contact surface of said housing spaced from the center line, the spacing between the center line and said last-mentioned contact surface being less than the spacing between the center line and said last-mentioned axial end surface, said fixed ring having a plurality of second pockets extending axially toward said fixed race, said bearing elements each being carried within a generally aligned pair of said first and second pockets and contacting said orbital and fixed races to prevent the rotation of said orbiting member by said bearing elements interacting with said orbital and fixed rings and to carry the axial thrust load from said orbiting member on said fixed race through said bearing elements.

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GEAR MACHINE WITH DISPLACEABLE CENTRAL HOUSING PART

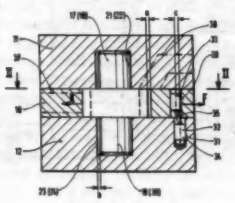
Günter Wolff, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stattgart, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,777

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1981, 3112470

Int. Cl.³ F04C *27/00*

U.S. Cl. 418—107 **10 Claims**



1. A gear machine, comprising a housing having a receiving recess and a sealing region; two gear members engaging with one another and arranged so that after mounting of the machine said gear members penetrate in a material removing manner into said sealing region of said housing for sealing purposes; and spring means for urging said gear members and said sealing region of said housing to contact with one another prior to a material removal from said housing, said housing having a plurality of housing parts which together form said housing and include one housing part defined by two intersecting bores completely surrounding said gear members, said spring means being arranged to displace said one housing part toward and against said gear members.

4,492,545

CAM RING FOR VANE PUMP

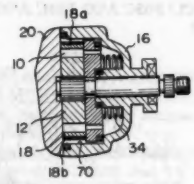
Norihiro Mochizuki, Inuyama, and Hiroyuki Hashizume, Kani, both of Japan, assignors to Kayaba Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 1, 1982, Ser. No. 364,357

Claims priority, application Japan, Apr. 6, 1981, 56-49270

Int. Cl.³ F04C *2/00, 15/00*

U.S. Cl. 418—149 **19 Claims**



1. A cam ring for a vane pump for a power steering system of a motor vehicle, the vane pump having a rotor which carries a plurality of vanes therewith for cooperation with a contoured inner wall of the cam ring, the cam ring comprising:

an inner ring member having two side walls and a contoured inner wall which defines a noncircular contoured bore for rotatably accommodating the rotor therein, said inner ring member having a passageway therein extending from one of said two side walls to the other of said two side walls and through which liquid to be pumped flows, said passageway being located radially outwardly of said contoured inner wall, said inner ring member being made of a sintered alloy material which is highly resistive to wear and provides for good lubrication;

an outer ring member receiving the inner ring member therein, said outer ring member being made of a second material other than sintered alloy, said second material having the property of being non-infiltratable by the working fluid, said outer ring member having a recess extending radially outwardly of said passageway, and

an oil seal means in said recess, said oil seal means being disposed radially outwardly of said passageway, said oil seal means preventing the working fluid from leaking between said inner and outer ring members.

4,492,546

ROTOR TOOTH FORM FOR A SCREW ROTOR MACHINE

Katsuhiko Kasuya; Hidetomo Mori; Mitsuru Fujiwara, and Tetsuzo Matsunaga, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 25, 1982, Ser. No. 436,371

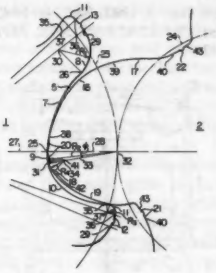
Claims priority, application Japan, Mar. 27, 1981, 56-43904; Apr. 24, 1981, 56-61182

Int. Cl.³ F01C *1/16, 1/24*

U.S. Cl. 418—201 **7 Claims**

1. Rotor tooth forms for a screw rotor of a rotor machine comprising a female rotor and a male rotor rotating about two axes parallel to each other, said female rotor having a rotor tooth form including a flank of a surface of advance comprising a first flank of the surface of advance formed by a second order curve, and a second flank of the surface of advance formed by an arc of a radius R_1 having a center thereof inside a pitch circle of the female rotor, and a flank of a surface of retrocession comprising a first flank of the surface of retrocession generated by a forward end portion of a lobe on the male rotor formed by an arc of a radius R_4 having a center thereof on a line drawn from a pitch point at an angle ϕ with respect to a straight line connecting the two axes together, and a second flank of the surface of retrocession formed by a circular arc of a radius R_3 smaller than the radius R_1 having a center

thereof inside the pitch circle of the female rotor, the rotor tooth form of the male rotor being essentially formed by generating loci of the flank of the surface of advance of the female rotor and the flank of the surface of retrocession thereof.



4,492,547

APPARATUS FOR MANUFACTURING A CONTINUOUS SLIDE FASTENER STRINGER

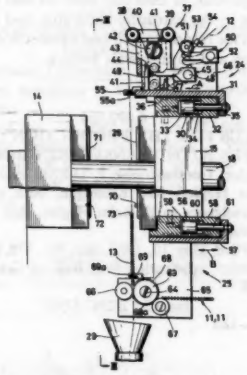
Akira Nogai, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Nov. 18, 1983, Ser. No. 553,249

Claims priority, application Japan, Nov. 19, 1982, 57-203280

Int. Cl.³ B29C *5/00*; B29D *3/00, 31/00*

U.S. Cl. 425—111 **6 Claims**



1. An apparatus for manufacturing a continuous slide fastener stringer including a continuous stringer tape and a row of injection-molded coupling elements secured to the stringer tape along a longitudinal edge thereof, said apparatus comprising:

(a) a frame;

(b) a pair of fixed and movable mold members supported on said frame and defining a series of mold cavities, said movable mold member being reciprocably movable between an advanced position in which said mold members are fully closed to hold one of successive part of the stringer tape, and a retracted position in which said mold members are fully opened for the passage therethrough of the stringer tape, said mold members having a pair of mating mold surfaces, respectively,

(c) a feeler disposed on said movable mold member adjacent to a trailing end of said mold cavities and projecting from the mold surface of said movable mold member toward said mold surface of said fixed mold member for detecting a trailing end of the injection-molded coupling elements;

(d) means disposed upstream and downstream of said mold members for intermittently advancing the stringer tape through said mold members;

(e) a pair of first and second tape shifters mounted on said movable mold member respectively upstream and downstream of said movable mold member and movable, in timed relation to said stringer-tape advancing means, with respect to said movable mold member to move said one part of the stringer tape between a first position in which said one part of the stringer tape lies flatwise on said mold surface of said movable mold member and said trailing end of the injection-molded coupling elements is engageable with said feeler, and a second position in which said one part of the stringer tape is spaced away from the last-mentioned mold surface and is held out of interference with said feeler; and

(f) said stringer-tape advancing means comprising a pair of drive and pinch rolls rotatably mounted on said second tape shifter, said drive roll being drivable to rotate in opposite directions, a braking device mounted on said first tape shifter for applying a braking force to said stringer tape, a tension roll vertically movably supported on said first tape shifter downstream of said braking device and carried on the stringer tape extending between said braking device and said drive and pinch rollers, and a roll holder mounted on said first tape shifter for preventing the downward movement of said tension roll.

4,492,548

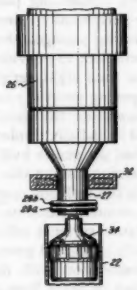
MACHINERY FOR MOLDING HEADPIECE FOR COLLAPSIBLE TUBE INCLUDING A CHILLED WIPER

Warren N. Hubert, Ducanville, Tex., assignor to RJR Archer, Inc., Winston-Salem, N.C.

Continuation-in-part of Ser. No. 121,827, Feb. 15, 1980, abandoned, which is a continuation-in-part of Ser. No. 72,104, Sep. 4, 1979, abandoned. This application Dec. 1, 1981, Ser. No. 326,325

Int. Cl.³ B29F *3/08*

U.S. Cl. 425—113 **5 Claims**



1. In a machine for molding a plastic head onto a cylindrical body, the improvement in an extruder for extruding the plastic material that is to be formed into the head comprising:

a nozzle having outlet ports, the plastic extruded from said ports positioning itself on said nozzle,

a chilled wiper member movable along said nozzle between a retracted position on one side of said ports and a protracted position at the outer end of said nozzle on the other side of said ports, said wiper when moving from said retracted position to said protracted position wiping off whatever plastic material has been extruded through said ports.

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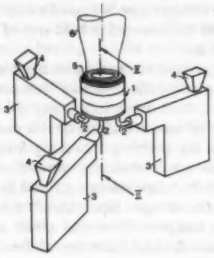
COEXTRUSION DIE

Ole-Bendt Rasmussen, Mundschöpfiweg, Walchwil/Zug CH-6318, Switzerland, and Borge Jensen, Virum, Denmark, assignors to Ole-Bendt Rasmussen Rasmussen, Walchwil/Zug, Switzerland

Division of Ser. No. 314,070 filed as PCT DK 81/00023, Feb. 27, 1981, published as WO 81/02406, Sep. 3, 1981 §102(e) date Oct. 20, 1981, Pat. No. 4,403,934.
This application Mar. 30, 1983, Ser. No. 480,311
Claims priority, application Denmark, Feb. 29, 1980, 891/80
The portion of the term of this patent subsequent to Sep. 13, 2000, has been disclaimed.
Int. Cl.³ B29F 3/04
U.S. Cl. 425—131.1 10 Claims



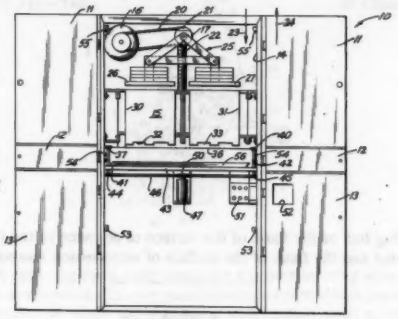
1. An extrusion die for the coextrusion of plural plastic materials into the form of a tubular film, said die comprising: (A) means for separately supplying at least two extrudable plastic materials in a fluid state; (B) a material distribution section comprising an array of annular elements providing a plurality of pairs of mutually contacting surfaces, at least one of said surfaces of each pair being recessed to define a labyrinthine distribution channel system for each such material, each said system having an inlet opening connected to one of said supply means and dividing into generally oppositely directed peripherally extending passages terminating in axially extending connecting passages which in turn divide into generally oppositely directed peripherally extending passages terminating in axially extending connecting passages which in turn divide into oppositely peripherally extending passages terminating in axially connecting passages, the number of said passage divisions being sufficient to provide for each extrudable material an array of at least eight peripherally spaced apart connecting passages opening generally axially through an end wall of said distribution section, the plural distribution channel systems being arranged in radially displaced relation at different radial distances from the center axis of the extrusion die; (C) an extrusion die section having one end wall contacting said distribution section end wall and comprising a plurality of concentric generally annular elements including generally spaced parallel concentric surfaces adjacent pairs of which define at least one axially elongated generally annular collecting chamber in communication with the open ends of the arrays of said connecting passages from said distribution sections, at least one of said annular elements defining said collecting chamber being mounted for rotation about its axis relative to said material distribution section and relative to at least the other of said annular elements defining said chamber, a common continuous annular extrusion orifice opening through the opposite end wall of said die section and connecting with the downsteam end of each such annular collecting chamber; (D) mechanical engagement means uniting the annular elements of said distribution and extrusion die sections, respectively, and maintaining said sections together and at least one of said annular sections free for said relative rotation with said end faces in contact; and (E) means for rotating said at least one rotatably mounted annular element of said die section about its axis relative to said distribution section and relative to said at least one other annular element.

4,492,550

EXTRUSION APPARATUS

Morris M. Levine, Scarsdale, N.Y., assignor to CIC Int'l. Corp., New York, N.Y.

Filed Dec. 5, 1983, Ser. No. 558,289
Int. Cl.³ A21C 3/04, 5/02, 11/18
U.S. Cl. 425—142 4 Claims



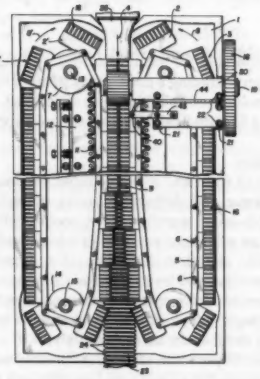
1. A dough extrusion apparatus comprising, a pair of hoppers, individual platens within each of said hoppers for movement therethrough, an extrusion die forming one side of each of said hoppers, a cutting wire space from said extrusion die, a pair of rotatably and axially movable spindles supporting said wire therebetween, a motor for driving said platens, a motor for driving said spindles a cabinet for enclosing the extrusion apparatus, at least one door on said cabinet for providing access to the extrusion apparatus, and safety interlock switch means for responding to said cabinet door by deenergizing said platen and cutting wire motors.

4,492,551

APPARATUS FOR THE PRODUCTION OF PLASTIC PIPES WITH TRANSVERSE GROOVES

Wilhelm Hegler, Goethestrasse 2, D-8730 Bad Kissingen, and Ralph-Peter Hegler, Bad Kissingen, both of Fed. Rep. of Germany, assignors to Wilhelm Hegler, Bad Kissingen, Fed. Rep. of Germany

Filed May 10, 1982, Ser. No. 376,737
Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120480
Int. Cl.³ B29C 17/07
U.S. Cl. 425—144 2 Claims



1. In apparatus for the production of plastic pipes with

transverse grooves, in which half-shells each provided with a mold recess, are arranged on a machine bed and driven in a cycle so that respective pairs thereof complete a mold on a molding path, an injection head of an extruder being located at the start of the molding path, and furthermore the half-shells being each provided with vacuum channels communicating with the respective mold recess, said channels joining into vacuum connections formed in the machine bed in the molding path, and the half-shells being provided with cooling channels which join into cooling water inlets and outlets formed in the machine bed in the molding path, the improvement comprising:

said cooling channels and said vacuum channels being completely separated from each other in the respective half shells, said cooling channels joining with cooling water return channels provided separately in the machine bed from the vacuum connections, said cooling water return channels being likewise subjectable to vacuum, and

means for automatically regulating the temperature of said half-shells including at least one means for sensing the temperature of a half-shell on the molding path and means for governing the quantity of cooling water per unit time flowing to said cooling water inlets,

said regulating means actuating said governing means to control the quantity of flowing cooling water when said sensed temperature exceeds a predetermined temperature,

the temperature of the half-shell being governed only by the quantity of flowing cooling water and maintained at a constant value during the molding operation,

said temperature sensing means contacting a smooth external surface of said mold half-shell on the molding path by means of a shoe.

4,492,552

APPARATUS FOR SLIDE FORMING OF PRESTRESSED CONCRETE

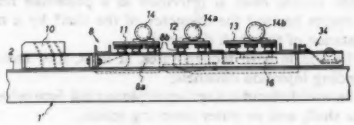
Yoshihiko Murakami, Tsukushino, and Noboru Ohta, Fukuoka, both of Japan, assignors to Fuji P.S. Concrete Co., Ltd., Fukuoka, Japan

Filed Apr. 30, 1982, Ser. No. 373,800

Claims priority, application Japan, May 1, 1981, 56-65188; May 6, 1981, 56-66893; May 21, 1981, 56-75638

Int. Cl.³ B28B 7/02

U.S. Cl. 425—218 **11 Claims**



9. Apparatus for slide forming a concrete product containing one or more ribs extending in the longitudinal direction of said product, comprising:

an elongated lower mold;

an upper frame member slideably disposed upon said lower mold;

first means disposed upon the forward end of said upper frame member for regulating the height of said concrete disposed atop said lower mold by removing excess concrete from said lower mold, and for preliminarily preshaping said concrete disposed upon said lower mold toward a predetermined configuration of said concrete product containing at least one longitudinally extending rib portion as will finally be determined by means of an upper mold of said apparatus, said first means including first vibration-inducing means for imparting requisite activity within said concrete disposed upon said lower mold so as to facilitate the movement of said concrete material disposed upon said lower mold and thereby achieve said height regulation and pre-shaping of said concrete;

second means, disposed rearwardly of said first means upon said upper frame member, including second vibration-inducing means, for vibrationally compacting and densifying said concrete disposed atop said lower mold whereby said concrete will tend to fill said upper and lower mold portions of said apparatus with a predetermined degree of densification;

third means, including said upper mold for cooperating with said lower mold in forming said concrete product to said predetermined configuration, disposed rearwardly of said second means upon said upper frame member for finally shaping said concrete product, including said at least one rib portion, so as to achieve said predetermined configuration, and further including third vibration-inducing means for achieving said finally shaped concrete product with a requisite degree of densification; each of said first, second, and third means being secured to said upper frame member independently of said other two means; and

shock absorbing means interposed between each of said first, second, and third means and said upper frame member for isolating each of said first, second, and third means from each other and said upper frame member whereby the vibrations induced within said concrete product by any one of said first, second, and third vibration-inducing means will be absorbed by said shock-absorbing means and not be transmitted to said upper frame member or to any other one of said first, second, and third means so as to effectively prevent the development of any vibrational interference or resonance between said first, second, and third means.

4,492,553

AUTOMATIC MACHINE FOR FORMING SHAPED PIECES OF DOUGH

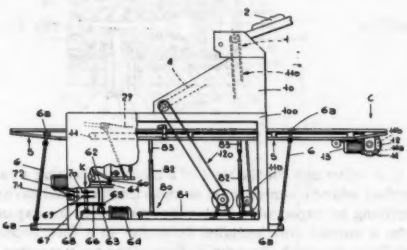
Folli Giulio, Via Ines Bedeschi, 5-Conselice-Ravenna, and Casadei Marino, Via Provinciale S. Mauro, 3501-Cesena (Forlì), both of Italy

Filed Jun. 20, 1983, Ser. No. 506,121

Claims priority, application Italy, Oct. 22, 1982, 3571 A/82

Int. Cl.³ A21C 11/10, 9/08

U.S. Cl. 425—308 **5 Claims**



1. In an automatic machine for forming shaped pieces of dough having closed or open configuration, comprising: a device for manipulating the moistened and kneaded flour, designed to furnish at least one continuous strip of dough and set in intermittent operation by first drive means; a first conveyor, set in intermittent operation by second drive means synchronously with the said first drive means, placed downstream of the said manipulation device, oriented downwards and destined to receive the said strip of dough in order to carry it downwards into the region of a station where the said pieces of dough are defined; a second conveyor positioned beneath the first conveyor, constituting, jointly with the lower extremity of the latter, the above-mentioned station that is destined to receive, resting thereon, the said strip and is set in intermittent

operation by third drive means on a time relationship basis with the said other drive means; and movable cutting means, positioned above the said second conveyor, downstream of the aforementioned station, destined to intercept, when in the operating position, the part of the said strip that is in between the first and the second conveyor, the said movable cutting means being set in intermittent operation by fourth drive means on a time relationship basis with the said first, second and third drive means; the improvement comprising: a frame for supporting the said second conveyor and the corresponding third drive means, and for supporting the said cutting means and the corresponding fourth drive means, secured by means of ball and socket joints to the extremity of at least three arms, the other extremity of which is secured, in each case, to a fixed structure by means of ball and socket joints; projections and blocks connected to the said frame, positioned beneath the lower extremity of the first conveyor perpendicularly to the movement direction of the second conveyor, destined, in cooperation with the said cutting means, when these are in the operating position, to shear the part of the strip that is in between the first and the second conveyor; means for operating the said frame on a time relationship basis with the said first, second, third and fourth drive means, defining for each point of the said frame, closed trajectories contained in horizontal planes; and means for stabilizing the vertical elevations of each point of the frame.

4,492,554

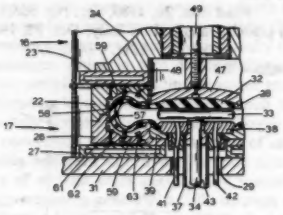
VALVE UNIT FOR A MOLD VENT

Russell W. Carter, Des Moines, Iowa, assignor to Corn States Metal Fabricators, Inc., Des Moines, Iowa

Continuation of Ser. No. 363,037, Mar. 29, 1982, abandoned, which is a continuation-in-part of Ser. No. 181,461, Aug. 20, 1980, Pat. No. 4,347,212. This application Jan. 3, 1983, Ser. No. 499,672

Int. Cl.³ B29H 5/02

U.S. Cl. 425—383 **7 Claims**



1. A valve unit for the vent of a mold for forming a rubber product wherein vented mold sections form a closed cavity for receiving an expandable rubber body member for expansion from a normal non-distended condition to a final expanded condition, in which the outer surface of the body member is in full conforming engagement with the inner surface of the cavity side wall and wherein the vent is in a side wall of the cavity and open to the atmosphere, said valve unit comprising:

(a) a first vent section having one end terminating in said inner surface of the cavity side wall,

(b) a valve seat at one end of said first vent section,

(c) a second vent section open to the opposite end of said first vent section and to the atmosphere, said second vent section having defined end portions,

(d) a valve member for opening and closing said vent including a stem portion located within and movable axially of said first vent section and a head portion movable to a vent closing position in seated engagement with said valve seat and to a vent opening position within said cavity and out of said seated engagement, said head portion, in the vent closing position therefor, having an exterior surface in smooth, continuous conformance with the inner surface of the cavity side wall, and

(e) a coil spring means only in said second vent section engageable with said stem portion and arranged in compression between said defined end portions for yieldably urging said head portion to said vent opening position, said head portion exterior surface engageable by the outer surface of the expandable body member for movement thereby into said seated position in the final expanded condition of the body member to provide for a positive venting of air through the vent and to the atmosphere as the body member is expanded from the non-distended condition to the final expanded condition therefor.

4,492,555

MULTIPLE HOT RUNNER INJECTION BUSH

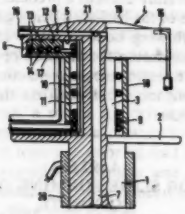
Wolfgang Schulte, Schalksmühle-Heedfeld, Fed. Rep. of Germany, assignor to Firma Jetform Heisskanalnormalien und Zubehor GmbH, Fed. Rep. of Germany

Filed Aug. 3, 1983, Ser. No. 519,996

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1982, 8222390[U]

Int. Cl.³ B29F 1/08

U.S. Cl. 425—548 **9 Claims**



1. A multiple hot runner injection bush for lateral tunnel gating, with a foot and a shaft heated by a heating element and a central hot sprue arranged therein, furthermore, with a nozzle head heated by a heating element wherein the nozzle head contains radially extending injection channels, characterized by the following features:

(a) the nozzle head is provided as a plate-like head and projects beyond the diameter of the shaft by a multiple distance of the shaft diameter;

(b) the nozzle head incorporates, at least, four radially extending injection channels;

(c) the nozzle head comprises a plane ring face adjacent to the shaft, and an outer covering apron;

(d) a copper ring is attached on the ring face;

(e) the copper ring carries a spirally arranged high capacity coil heater;

(f) the heating element for the nozzle head and the heating element for the shaft are independently controllable.

4,492,556

UNITARY HEATED NOZZLE ASSEMBLY

Walter R. Crandell, Addison, Ill., assignor to Fast Heat Element Mfg. Co., Inc., Elmhurst, Ill.

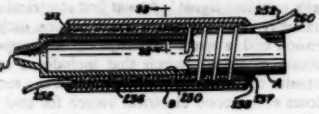
Division of Ser. No. 951,609, Oct. 16, 1978, Pat. No. 4,304,544, which is a continuation-in-part of Ser. No. 705,996, Jul. 16, 1976, Pat. No. 4,120,086, which is a continuation-in-part of Ser. No. 516,618, Oct. 21, 1974, Pat. No. 3,970,821. This application Dec. 8, 1981, Ser. No. 328,747

Int. Cl.³ B29F 1/03

U.S. Cl. 425—549 **18 Claims**

1. A unitary heated nozzle assembly for delivering under pressure a melt stream of moldable material to a mold having cavity means for forming parts therein, said assembly comprising a heat conductive metal body suitable for withstanding

molding pressures having a passage therein for conveying said melt stream of moldable material into said mold, unsheathed electrical heater assembly means within said body arranged in heat transfer relation to said melt stream in said passage, a sandwich of layers of electrically insulating heat conductive particles compressed together and encapsulating said heater



assembly means, said sandwich, heater assembly means and body forming an integral void-free compacted mass embedding said heater assembly means in said sandwich and said sandwich and heater assembly means in said body, and electrical lead wires attached to said heater assembly connecting it with a source of current.

4,492,557

FILAMENT QUENCHING APPARATUS

Valton O. Ray, Irmo; Robert H. Roeland, Columbia, both of S.C.; Carl H. Potter, Richmond, Va., and Yehuda I. Szmullowicz, Columbia, S.C., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jul. 19, 1983, Ser. No. 515,096
Int. Cl.³ B29C *25/00*
U.S. Cl. 425—72 S **12 Claims**

1. Apparatus for quenching a melt extruded filament, comprising

(a) a quenching chamber through which said filament can pass;

(b) a plenum chamber, said plenum chamber having a gas entry opening and being separated from said quenching chamber by

(c) a diffuser, said diffuser comprising a layer of foam with at least two areas of differing porosity; whereby a varied gas distribution pattern into the quenching chamber can be achieved.

4,492,558

SMOKELESS WASTE GAS BURNING USING LOW PRESSURE STAGED STEAM

Robert E. Schwartz, and Michael R. Keller, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed May 16, 1983, Ser. No. 494,941
Int. Cl.³ F23D *13/20*
U.S. Cl. 431—4 **3 Claims**

1. A flare stack for waste gases to be burned above the tip;

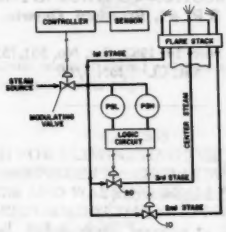
means to inject smoke suppressant from a steam source which does not exceed 50 p.s.i.g. into said burning gases through at least two separate manifolds and injection nozzles which are about the flare stack adjacent the tip;

a smoke suppressant conduit connected from a supply conduit to each manifold;

a normally closed valve means to control the quantity of smoke suppressant to each manifold except the first;

means to sense the need for smoke suppressant as a function of the need for smoke suppression;

a modulating valve in said supply conduit operated by said means to sense the need for smoke suppressant;



means downstream of said modulating valve to sense the flow or pressure of said smoke suppressant;

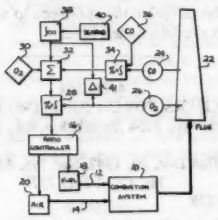
means to control the opening of each of said normally closed valve means as a function of the flow or pressure downstream of said modulating valve so that the pressure of said smoke suppressant downstream of said normally closed valve means will not be below that necessary to maintain at least sufficient mechanical kinetic energy in each of said manifolds and injection nozzles for smokeless burning of said waste gases.

4,492,559

SYSTEM FOR CONTROLLING COMBUSTIBLES AND O_2 IN THE FLUE GASES FROM COMBUSTION PROCESSES

Robert E. Pocock, Highland Heights, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Nov. 14, 1983, Ser. No. 551,550
Int. Cl.³ F23N *5/00*
U.S. Cl. 431—12 **6 Claims**



1. A method of controlling a fuel/air ratio of a fuel/air mixture for a combustion process which produces flue gases having a combustible content and an oxygen content, comprising;

selecting a low combustion content set point value corresponding to a desired level of combustible content in the flue gas;

selecting an oxygen content set point value corresponding to a desired level of oxygen content in the flue gas;

sensing the combustible content of the flue gas to generate a first signal corresponding to the actual combustible content of the flue gas;

simultaneously, sensing the oxygen content of the flue gas to

generate a second signal corresponding to the actual oxygen content of the flue gas;

using said first signal corresponding to an actual combustible content of the flue gas to adjust said selected oxygen content set point value; and

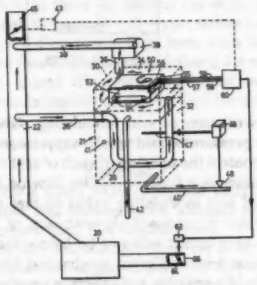
controlling the fuel/air ratio exclusively as a function of said adjusted oxygen content set point value and said second signal.

4,492,560

GAS COMBUSTION CONTROL APPARATUS

Hardy Sundberg, R.R. #1, Brantford, Ontario, Canada N3T 5L4

Filed Nov. 14, 1983, Ser. No. 551,751
Int. Cl.³ F23N *5/00*
U.S. Cl. 431—12 **21 Claims**



1. Apparatus for controlling the combustion of a fuel in an appliance comprising:

means for receiving the exhaust gases of the appliance,

means for maintaining the exhaust gases at a substantially constant temperature between the steam point and the dew point of the gases,

humidity sensor means for monitoring the relative humidity of the substantially constant temperature exhaust gases and for producing an output signal upon the relative humidity deviating from a predetermined level, and

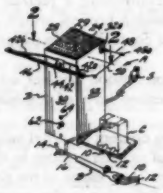
control means for using said output signal to control the combustion of fuel in the appliance to maintain the humidity at said predetermined level.

4,492,561

WELDERS TORCH IGNITING DEVICE

Richard R. Braswell, 3154 Studebaker Rd., Long Beach, Calif. 90808

Filed Dec. 20, 1982, Ser. No. 451,285
Int. Cl.³ F23Q *7/10*
U.S. Cl. 431—128 **1 Claim**



1. In combination with a source of alternating electric power a device for igniting a mixture of oxygen and acetylene flowing from a tip of a welders torch, said device including:

a. a vertically disposed housing that includes an upper end that has a plurality of spaced openings therein;

b. an electrical circuit that may be connected to said source of electrical power, said electrical circuit including first and second portions, said first portion incuding an electrically operated signal light and first electrical switch that is manually operated, said second portion including a high tension coil, a spark plug adjacent said upper end and a second electrical switch that includes a spring loaded actuator that when moved from a first to a second position closes said second electrical switch for said high tension coil to generate a spark at said spark plug, said first electrical switch and signal light mounted on said housing, and said signal light when illuminated indicating that said device is in an operating condition;

c. a bracket supported from said housing adjacent said top, said bracket including first and second spaced arms;

d. a tensioned helical spring that has a first elongate substantially straight end portion in which a loop is defined and a second end, said second end secured to said second arm and said loop pivotally engaging said first arm; and

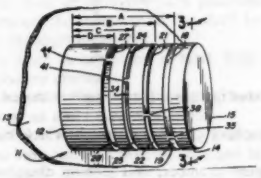
e. a cord that extends from the extremity of said straight end portion to said actuator, said helical spring when pressure contacted by said tip when the latter is disposed to discharge said oxygen-acetylene mixture onto said top flexing transversely and said straight end portion pivoting to tension said cord to move said actuator from said first to said second position to complete said second portion of said electrical circuit for said high tension coil to generate a spark at said spark plug to ignite said oxygen-acetylene mixture, with said actuator automatically moving to said first position when said tip is removed from contact with said helical spring.

4,492,562

PREMIX-TYPE BURNER DISTRIBUTER TIP

Frederick A. Michel, Alvin, Tex., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 27, 1983, Ser. No. 489,129
Int. Cl.³ F23C *5/08*
U.S. Cl. 431—177 **4 Claims**



1. In combination with a premixed fuel-oxygen burner adapted to project a burning premixed fuel-oxygen mixture to an interior surface of a furnace in which surface the burner is mountable and which surface then radiates heat to the interior of the furnace, the burner comprising a distributor tip which, when mounted in the interior surface, extends lengthwise from the furnace interior surface into the interior of the furnace and through which the fuel-oxygen mixture passes into the furnace; the improvement comprising a distributor tip comprising an end wall and a slotted cylindrical sidewall extending axially perpendicularly from the interior surface and wherein a plurality of arcuate slots spaced along the length of the side wall at different distances from the interior surface and extending lengthwise circumferentially therein form exclusive paths for passage of the fuel-oyxgen mixture into the interior of the furnace, with each slot extending through the side wall at an angle with respect to the axis of the cylindrical side wall so that all of the slots collectively direct the fuel-oxygen mixture to a

predetermined region of the interior surface, and wherein the slots in the cylindrical side wall at a relatively greater distance from the interior surface of the furnace in which the distributor tip would be mounted are formed therein at a more acute angle with respect to the axis of the cylindrical side wall than are the slots in the cylindrical side wall at a relatively closer distance from the interior surface of the furnace in which the distributor tip would be mounted.

4,492,563

BURNER FOR HEATING AIR AND DISPOSED IN A PASSAGE THROUGH WHICH AIR FLOWS

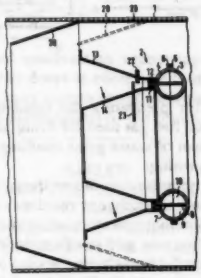
Klaus Reinhold, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Apr. 22, 1983, Ser. No. 487,466

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3214923

Int. Cl.³ F23Q *3/00*

U.S. Cl. 431—264 **4 Claims**



1. A burner for heating air and disposed in a passage through which the air flows, comprising: a tube which is connected to a gas supply and having mixing plates with flow apertures for the air, the mixing plates secured to the tube to diverge from each other conically in the direction of air flow, the tube being provided with gas outlet apertures between the mixing plates and having the form of a circular annulus in which the gas outlet apertures are disposed in a circular array, the mixing plates including an outer conically diverging plate and an inner conically converging plate which are at least partially bounded over their axial length by an air guide plate which converges conically in the direction of air flow and which is carried on an inner surface of the air passage for axial displacement, and ignition means disposed downstream of the gas outlet apertures.

4,492,564

CLAMPING MEANS FOR MATRIX IN RADIANT GAS BURNER

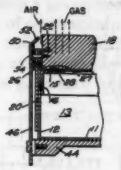
Robert A. Wolf, Coventry, R.I., assignor to Radiant Heat, Inc., Coventry, R.I.

Filed Jun. 24, 1983, Ser. No. 507,664

Int. Cl.³ F23D *13/12*

U.S. Cl. 431—328 **2 Claims**

1. A radiant gas burner comprising a gas permeable matrix, a combustion gas plenum having means to support the marginal edges of the matrix, a plurality of clamping clips about the marginal edge of the matrix, said clips fastened to the plenum and having inturned terminal edges engaging the matrix, a non-combustible gas supply enclosure, said enclosure having plate means extending in spaced relation to said clips and terminating beyond the clips, said plate means having



inturned terminal edges to direct a stream of non-combustible gas on the marginal matrix edge.

4,492,565

METHOD FOR ELIMINATING THE SKID MARKS FROM WORKPIECES HEATED IN WALKING BEAM FURNACES AND WALKING BEAM FURNACE FOR PERFORMING THE SAID METHOD

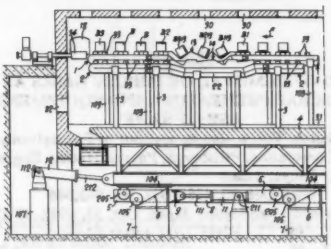
Bruno Feroldi, Genoa, Italy, assignor to Italimpianti Societa Italiana Impianti P.A., Italy

Filed Jan. 11, 1983, Ser. No. 457,251

Claims priority, application Italy, Jan. 22, 1982, 12413 A/82

Int. Cl.³ F27D *3/00, 3/04;* F27B *9/14*

U.S. Cl. 432—11 **11 Claims**



1. A method of elliminating or minimizing the effect of localized cooling on metallurgical articles (B) due to contact with cooled fixed and/or walking beams (1, 2) in a walking beam furnace for heating metalurgical articles (B), such as billets, blooms and the like, characterized by turning each metallurgical article over 180° around its longitudinal axis at least once at a region within the furnace and near the discharge end (18) thereof and thereafter maintaining the metallurgical articles in the furnace for a period of time sufficient to eliminate or substantially reduce areas of such localized cooling.

4,492,566

METHOD AND APPARATUS FOR HEAT TREATMENT OF FINE-GRAINED MATERIAL

Wilfried Kreft, Ennigerloh, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Mar. 21, 1983, Ser. No. 477,066

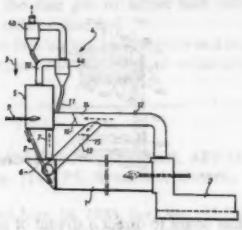
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1982, 3212009

Int. Cl.³ C04B *7/02;* F27B *15/00, 7/02*

U.S. Cl. 432—14 **15 Claims**

1. In a method for the heat treatment of fine-grained material wherein such material is preheated in a preheating zone, then precalcined in a precalcining zone, and then delivered to a sintering zone the exhaust gases of which flow in a single stream to said precalcining zone and thence to said preheating zone, said material being delivered from said sintering zone to a cooling zone from which tertiary air is discharged, the im-

provement comprising dividing said tertiary air into two branches; mixing the air of one of said branches with said



stream of exhaust gases in a region between said sintering zone and said precalcining zone; and introducing the air of the other of said branches directly into said precalcining zone.

4,492,567

METHOD OF REMOVAL OF IMPURE GASES AT THE TIME OF SCRAP PREHEATING, AND EQUIPMENT FOR USE OF SAME

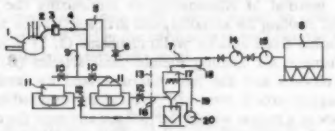
Kazunori Saitoh, Tokyo, Japan, assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa. and Hotaka Engineering Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1983, Ser. No. 543,988

Claims priority, application Japan, Oct. 13, 1982, 57-178440

Int. Cl.³ F24H *7/00*; B01D *47/00*

U.S. Cl. 432—30 **5 Claims**



1. A method of preheating scrap metal with impure gases containing particulates and discharging from a metallurgical furnace, the method comprising the steps of:

burning said impure gases in a combustion chamber,

conducting a first portion of the combustion products from said combustion chamber to a container of scrap metal,

contacting the scrap metal with said combustion products for preheating the scrap whereby additional impurities are generated and entrained in said combustion products,

washing in a wet scrubber the combustion products and entrained additional impurities,

mixing the first portion of the combustion products and entrained additional impurities after wet scrubbing with a second portion of the combustion products from said chamber,

and removing particulates from the mixture of the second portion of combustion products and the first portion of combustion products and the entrained additional impurities after the wet scrubbing thereof.

4,492,568

PROCESS AND APPARATUS FOR PREHEATING THE COMBUSTION MEDIUMS USED FOR FIRING BLAST FURNACE STOVES

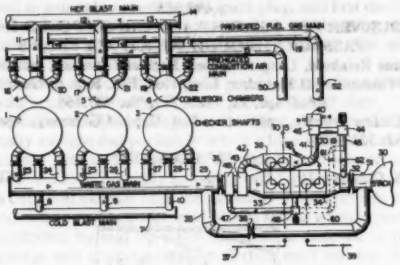
Helmut Palz, Wiesbaden, Fed. Rep. of Germany, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 9, 1983, Ser. No. 559,683

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1982, 3246255; Dec. 30, 1982, 3248623

Int. Cl.³ F24H *7/00, 1/00*; F28C *3/10*; C21C *5/48*

U.S. Cl. 432—30 **17 Claims**



1. A process for preheating the combustion mediums of combustion air and fuel gas used for firing blast furnace stoves by utilizing the heat of waste gases resulting from such firing, said process comprising:

passing said combustion mediums through respective heat exchangers in heat exchange relationship with said waste gases, and thereby preheating said combustion mediums;

further preheating one said combustion mediums, after the passage thereof through the respective said heat exchanger, by an externally fired recuperator;

feeding flue gases from said externally fired recuperator to said waste gases before preheating of said one combustion medium by said waste gases; and

controlling the external firing of said recuperator as a function of the final preheated temperature of the thus twice preheated said one combustion medium.

4,492,569

OVEN

Alex D. Vestergaard, Kastrup, Denmark, assignor to Ingeniørfirmaet Lytzen KS, Herlev, Denmark

Filed Feb. 28, 1983, Ser. No. 470,182

Claims priority, application Denmark, Mar. 3, 1982, 915/82

Int. Cl.³ B01D *45/00, 39/00*; A21B *1/00*

U.S. Cl. 432—72 **2 Claims**

1. An oven for connectively separating two otherwise independent, isolated medium chambers, said oven comprising:

means forming an air-tight oven shell;

an internal four sided chamber within said oven shell;

means in said oven adjacent said chamber forming a closed path channel for conducting air within said oven;

means for circulating air in said closed path;

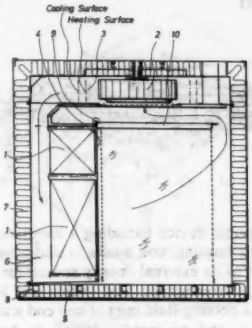
at least two doors in said oven shell, one located adjacent each of two of the sides of said chamber, only one of said doors being able to be opened at a time;

a filter assembly located in said oven at one side of said chamber and in said closed path through which all air circulating therein must pass;

means forming a funnel-shaped suspension system releasably mounting said filter assembly in said closed path, said suspension system being secured to the outermost portion of said means forming said air channel;

a frame included in said filter assembly mounting the filters of the filter assembly through which all air passes in said

closed path, said frame being releasably mounted by said suspension system to allow expansion and contraction of said frame with temperature changes while said funnel-shaped suspension system correspondingly expands and contracts, thereby preventing bypass of air around the filters; and



a rail and wheel combination supporting said frame and located over the doors to allow said frame when released by said suspension system to roll adjacent at least one of the doors and allow access to the filters.

4,492,570

CALCINING SYSTEM PROVIDED WITH A PLANETARY COOLER

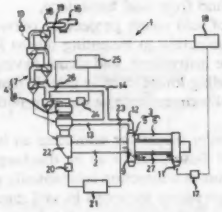
Takeshi Suzuki; Mikio Murao; Masahiro Uchida; Chikanori Kumagai, and Yasuhiko Yotsui, all of Kobi, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Sep. 2, 1983, Ser. No. 528,970

Claims priority, application Japan, Sep. 2, 1982, 57-153745; Dec. 9, 1982, 57-186280

Int. Cl.³ F27B *7/02*

U.S. Cl. 432—106 **3 Claims**



1. A calcining system wherein raw material is preheated by raw material preheating means for preheating the raw materials by contact with a gas, calcined in a rotary kiln and cooled in a planetary cooler; a portion of cooling gas used for cooling the calcined materials in the planetary cooler and heated thereby is led through an air extracting duct to said raw material preheating means and the rest of the heated cooling gas is introduced into the rotary kiln; and exhaust gases from the rotary kiln is led to the raw material preheating means, wherein the improvement comprises:

a first damper mounted in a duct for exhausing the exhaust gas from said raw material preheating means;

a temperature sensor for sensing the temperature of calcined material discharged through an outlet of said planetary cooler;

a control means operative to increase the degree of opening of said first damper when the temperature sensed by said temperature sensor rises to a high level;

a second damper mounted in said air extracting duct;

a gas sensor for sensing a gas component capable of indicating the condition of combustion in the rotary kiln; and

a control means for controlling the degree of opening of the second damper so as to bring the value of the gas component sensed by the gas sensor to a predetermined level.

4,492,571

BAKING AND DRYING FURNACE FOR CONTAINERS SUCH AS CANS

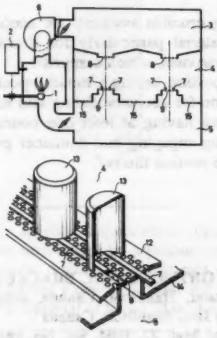
Hideo Miura, Yokohama, Japan, assignor to Toyo Seikan Kaisha, Ltd., Japan

Filed Jul. 30, 1982, Ser. No. 403,359

Claims priority, application Japan, Jul. 31, 1981, 56-112863[U]

Int. Cl.³ F24J *3/00*; F26B *25/00*

U.S. Cl. 432—225 **2 Claims**



1. A baking and drying furnace for containers comprising

(A) a hot air supply chamber,

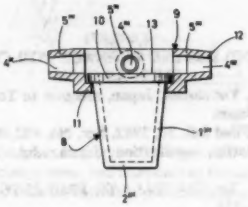
(B) a container passage chamber,

(C) a hot air recovery chamber, and

(D) a hot air reservoir.

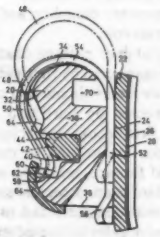
wherein said container passage chamber and said recovery chamber are connected by first and second suction nozzles and said hot air reservoir and said container passage chamber are connected by third and fourth suction nozzles wherein said first, second and at least one row of said third suction nozzles are located so that when a container is placed in said furnace, said first, second and at least one row of said third suction nozzles are covered by the inside diameter of said container and at least one row of said fourth suction nozzles is located externally of the outside diameter of said container, whereby hot air moves substantially from said hot air supply chamber, passes through said passage chamber, said fourth suction nozzles, into said hot air reservoir, through said third suction nozzles into the interior portion of said container, and through said first suction nozzles into said recovery chamber, and wherein said second suction nozzles are covered by a means for transporting said containers through said furnace, wherein said first suction nozzles are one tenth to one half the inside diameter of said container, said third suction nozzle are one tenth to one third of said container diameter, and said means for transporting said containers comprises conveyor belts, said conveyor belts being laid in sliding belt guide grooves and covering the said second suction nozzles whereby said belt is attracted to said groove.

4,492,572
MELTING CRUCIBLE
Horst Lisa, Hirschbach, Fed. Rep. of Germany, assignor to Lisa Elektronik GmbH, Hirschbach, Fed. Rep. of Germany
Filed Apr. 9, 1982, Ser. No. 366,987
Claims priority, application Fed. Rep. of Germany, May 12, 1981, 3118750
Int. Cl.³ F27B 14/00; B65D 5/72; C21B 3/00
U.S. Cl. 432—263 12 Claims



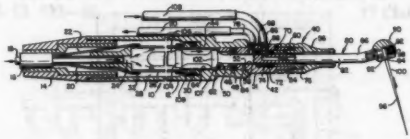
1. A melting crucible assembly for accommodating small amounts of material particularly for dental, analytical and metallurgical purposes, which comprises:
a container portion having a mouth opening and an upper edge portion for accommodating said material; and
a pouring ring having at least one pouring opening, said pouring ring engaging said container portion about said upper edge portion thereof.

4,492,573
ORTHODONTIC BRACKET
Gustaf H. Hanson, Hamilton, Canada, assignor to Augusta Developments Inc., Hamilton, Canada
Filed Mar. 27, 1984, Ser. No. 593,222
Int. Cl.³ A61C 7/00
U.S. Cl. 433—11 12 Claims



1. An orthodontic bracket comprising a bracket body having lingual, labial, gingival, occlusal, distal and mesial surface portions and a mesial-distal extending arch wire slot opening to the labial surface portion, and a retainer member of resilient material having labial and lingual portions in embracing sliding engagement with corresponding labial and lingual surface portions of the body, the retainer member being movable on the body between two positions in which the open labial side of the slot is respectively open and closed, wherein the mesial distal extending slot is provided in its gingival surface immediately adjacent to the labial bracket surface with a mesial distal extending retainer against which the end of the retainer member labial portion can engage when in slot-closed position to prevent labial movement of the thus engaged retainer member end of more than a predetermined extent.

4,492,574
ULTRASONIC ENDODONTIC DENTAL APPARATUS
George E. Warrin, North Merrick, and Rene J. Perdreaux, Brooklyn, both of N.Y., assignors to Cavitron, Inc., Long Island, N.Y.
Filed Apr. 15, 1983, Ser. No. 485,421
Int. Cl.³ A61C 5/02
U.S. Cl. 433—81 14 Claims

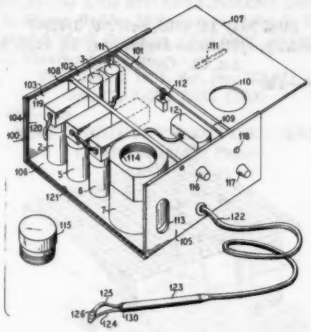


1. In an ultrasonic device including a handpiece having an elongated hollow housing, coil means in said housing adapted to be connected to an external energy source for establishing an alternating electromagnetic field within said housing, said housing having a cooling fluid inlet at one end and being open at its other end, and an insert adapted to be removably mounted on the other end of said handpiece, said insert comprising,
an elongated hollow body having one end adapted to be insertably mounted in said open end of said housing with said one end of said body being in fluid communication with the interior of the housing whereby cooling fluid admitted into said housing can flow into said body,
a tool support assembly telescopingly received in said body, said tool support assembly including an elongated shank having vibrating means rigidly mounted on one end, said vibrating means projecting from the open end of the said body in position to be vibrated by the electromagnetic field when said body is mounted in said housing,
seal means provided within said insert between said body and said shank outboard of said housing for directing the flow of cooling fluid through said body between said seal means,
cooling fluid outlet means in said body between said seal means and said one end of said body providing a flow path for cooling fluid from said handpiece,
the other end of said shank projecting outward from said body and terminating in mounting means for supporting an endodontic instrument, said shank having a fluid flow passage extending longitudinally therein from said mounting means and terminating at a location within said body, and
irrigation fluid inlet means for admitting an irrigation fluid into said fluid flow passage to be discharged from said mounting means in a direction substantially parallel to the endodontic instrument mounted in said mounting means, whereby said irrigation fluid and said cooling fluid may be separately controlled.

4,492,575
DENTAL PROPHYLACTIC APPARATUS
Pierre Mabille, Le Sentier, Switzerland, assignor to Electro Medical Systems, S.A., Le Sentier, Switzerland
Filed Apr. 27, 1983, Ser. No. 489,122
Claims priority, application France, Jun. 22, 1982, 82 10920
Int. Cl.³ A61C 3/02
U.S. Cl. 433—88 18 Claims

1. A prophylactic apparatus for cleaning teeth with a flow of air containing powder particles, said apparatus comprising a hand piece with a first nozzle opening and a second nozzle opening, a water line with a valve means extending from a source of water and being connected to the first nozzle opening, a first air line extending from a source of pressurized air to a mixing device, first control means disposed in said first air

line for controlling flow of air therethrough, said first air line between the first control means and the mixing device having a section containing at least one air filter, said mixing device having a chamber for receiving powder to be fluidized and mixed with air to form air laden with powder particles, said mixing device having a nozzle connected to the first air line being disposed in the chamber above the level of powder



therein and a discharge opening disposed above the level of powder in the chamber connected to a second air line extending to the second nozzle opening of the hand piece, second control means for controlling the flow of air laden with powder particles in said second air line and means for unclogging each filter by creating a reverse flow of air through the chamber, the jet nozzle, the section of the first line and through each filter.

4,492,576

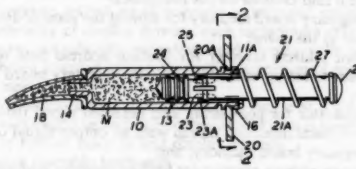
DENTAL SYRINGE AND METHOD OF PACKAGING AND DISPENSING A DENTAL MATERIAL

William B. Dragan, R.F.D. 1 Burr St., Fairfield, Conn. 06430

Filed Jun. 15, 1982, Ser. No. 388,649

Int. Cl.³ A61C *5/04*; A61M *5/31*

U.S. Cl. 433—90 **14 Claims**



1. A dental syringe for extruding dental materials comprising:

a handle means and a cartridge adapted to contain a bulk supply of said dental material sufficient to perform a plurality of dental procedures whereby said cartridge defines the barrel portion of said syringe,

said cartridge comprising an elongated barrel having a rear open end and a forward discharging orifice portion,

a freely displaceable portion disposed in said barrel portion for sealing the rear end thereof,

a plunger means adapted to extend into the rear open end of said barrel for engaging said piston,

said plunger means having an end portion for engaging the rear of said piston for effecting the displacement of said piston within said barrel as said plunger means is activated to extrude a proportional amount of said material,

a spring means for normally biasing said plunger means toward a retracted inoperative position and a valving means including a vent slot disposed on the end of said plunger means for engaging said piston for venting the area to the rear of the piston for creating a vacuum between said piston and said plunger to effect a pull back of said piston to relieve the back pressure of said material acting on said piston upon the termination of an extruding operation so as to prohibit any drooling of the material from the cartridge.

4,492,577

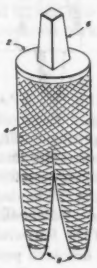
SURGICAL IMPLANTS WITH SOLID INTERIORS AND POROUS SURFACES

Edward T. Farris, 4715 Greenville Ave., Dallas, Tex. 75206, and J. Lester Matthews, 6944 Lakewood Blvd., Dallas, Tex. 75214

Filed Oct. 25, 1982, Ser. No. 436,618

Int. Cl.³ A61C *8/00*

U.S. Cl. 433—201 **4 Claims**



1. A device for surgical implantation comprising a solid metallic core piece surrounded by a porous shell formed of a woven, metal material bonded firmly to said core piece, the pores of the shell having a depth of about 300 microns or less and a diameter or a diagonal of about 50 to about 500 microns.

4,492,578

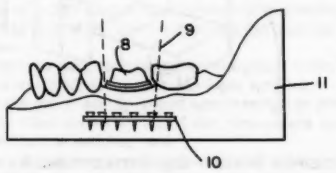
PLASTIC LAMINAR DIGITALLY INDEXED DENTAL DIE SYSTEM

William Hann, 325 Ashlawn Dr.; Sanford D. Bosin, P.O. Box 9371, both of Norfolk, Va. 23595, and Cecil White, 1464 Longdale Dr., Norfolk, Va. 23513

Filed Sep. 29, 1983, Ser. No. 511,748

Int. Cl.³ A61C *11/00, 13/02*; B32B *3/00*

U.S. Cl. 433—213 **3 Claims**



1. A device for keying a dental model to a dental model base comprising:

a polymeric sheet having a generally flat web portion and having projections extending from opposite sides of said web portion, said projections from a first of said sides being in the shape of cones with broad base portions of said cones being connected to said web portion and tips of said cones being spaced from said web portion and said projections from a second of a said sides having broad end portions spaced from said second of said sides.

4,492,579

DENTAL JACKET CROWN, COPING AND METHOD OF CONSTRUCTION

Itzhak Shoher, 50 Shlomo Hamelech St., Tel-Aviv, and Aharon Whiteman, 13 J. L. Perez St., Petach-Tikvah, both of Israel

Continuation-in-part of Ser. No. 414,415, Sep. 2, 1982, Pat. No. 4,459,112. This application Apr. 22, 1983, Ser. No. 487,839
The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.
Int. Cl.³ A61C 5/08
U.S. Cl. 433—222 10 Claims

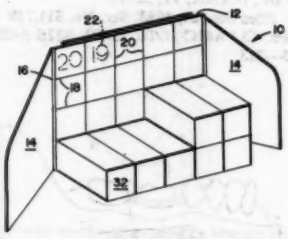
1. A jacket crown comprising a composite body including a thin foil of high fusing temperature metal substantially of platinum having a surface geometry conforming to a die to which it has been adapted with the foil having a minimum of at least three folded over pleats in a substantial symmetrical arrangement around the body of the foil with each pleat forming a triangular like flap in the unfolded position and wherein said foil has an unfolded area substantially in the center of the foil body with said foil having at least one thin coated layer of a gold based noble metal composition of up to 100% gold superimposed over one surface of said thin foil and disposed beneath the folded over pleats and a relatively thick outer coating of a dental veneering material.

4,492,580

WEIGHT-LOSS MOTIVATION KIT

Herbert J. Sabel, 543 Avenue Del Oro, Sonoma, Calif. 95476

Filed Mar. 30, 1984, Ser. No. 594,744
Int. Cl.³ G09B 19/00
U.S. Cl. 434—127 5 Claims



1. A device for motivating dieters to maintain a weight-loss program, comprising a display board with indicia on its front side forming an array of spaces each with a symbol therein indicating a preselected number of pounds that the dieter must lose in a diet program;

a plurality of foldable cartons for use with said display board each carton being symbolic of a pound of removable human weight and, when erected, having end surfaces with substantially the same dimensions as one of said array of spaces, a number of said cartons being stacked against said board to cover a like number of spaces;

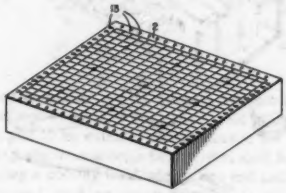
whereby each time a user of said device is weighed during a weight-loss program, a said carton is removed for each pound lost or a said carton is added for each pound gained from the dieter's previous weight measurement.

4,492,581

GAMEBOARD TEACHING APPARATUS

Kazuo Arai, and Takeshi Shimamoto, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 11, 1982, Ser. No. 377,247
Claims priority, application Japan, May 14, 1981, 56-73054
Int. Cl.³ G09B 19/22
U.S. Cl. 434—128 4 Claims



1. A game apparatus comprising:

a game board on which a player plays a game;

game pieces for the game;

a memory means for storing coded data of orders of development of the game or problems of the game;

a game piece detecting means for detecting a position of a game piece on the game board and for providing a detected signal;

a display means for displaying the next move of the game piece;

a control means for controlling said display means to display according to said coded data stored in said memory means when said detecting means detects a move of the game piece;

wherein said game piece detecting means comprises a plurality of game piece sensors for detecting the game piece and a sensor selecting means for selecting one of said game piece sensors; and

wherein said control means comprises:

an imaginary board memory for storing the state of development in the game;

a sensor address counter for feeding address data to said sensor selecting means and to said imaginary board memory;

a comparator for comparing said detected signal from said game piece detecting means with an output signal of said imaginary board memory; and

a memory address counter for feeding memory address data to said memory and incrementing the memory address data when triggered by an output signal from said comparator, said control means causing said display means to display the next coded data in said memory means only when said detected signal and said output signal of said imaginary board memory are equal;

wherein said control means further comprises:

an address comparator for comparing the address data from said sensor address counter with said coded data from said memory, said address comparator being triggered by the output of said comparator;

a false counter for counting up a signal from said address comparator;

a presettable number means for presetting a specified number; and

a number comparator for comparing an output of said false counter with the specified number of said presettable number means, said control means causing said display means to display said coded data from said memory means when triggered by an output from said number compara-

tor, whereby said display means displays a position for placing a game piece when the address data from said sensor address counter is equal to the coded data and the output of said false counter is equal to the specified number.

4,492,582

TEACHING AND ENTERTAINMENT DEVICE

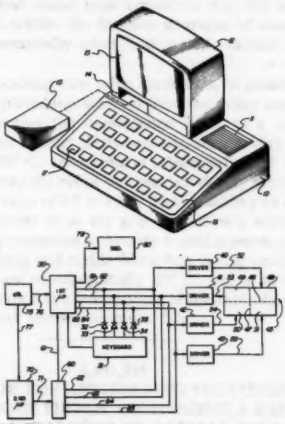
Richard S. Chang, Rolling Hills Estates; John Y. Ling, Chino, and Daniel J. Shoff, Torrance, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 6, 1981, Ser. No. 222,847

Int. Cl.³ G09B 7/02, 13/00

U.S. Cl. 434—169 **7 Claims**

MICROFICHE APPENDIX INCLUDED
(2 Microfiche, 192 Pages)



1. A teaching and entertainment device comprising:

display means including a matrix of individually operable display cells, each of said display cells configurable into selected one of at least two image states and requiring periodic refreshing to maintain an imposed image state;

a plurality of display drivers, each including a driver memory, periodically refreshing said display cells and each being coupled to and controlling a portion of said display means;

information means for displaying a figure at a location on said matrix including portions of said matrix under control of two or more of said display drivers;

a user operable keyboard;

a first microprocessor, including first microprocessor memory means in which a predetermined coded program is stored, coupled to said first microprocessor memory means, said keyboard and said plurality of display drivers, said first microprocessor being operable in a dominant first mode, in which it periodically poles said keyboard and responds thereto in accordance with said stored program to carry forth computational and interactive teaching and entertainment activities and to alter the image upon said display means, and in a subservient second mode;

a plug-in cartridge;

a plug-in cartridge receiving means for receiving and making electrical connections to said plug-in cartridge;

a second microprocessor, having second microprocessor memory means and housed within said plug-in cartridge, said second microprocessor being electrically compatible with said first microprocessor;

means cooperating with said first microprocessor and said second microprocessor to establish a master-slave relationship between said first and second microprocessors whenever said plug-in cartridge is received by said plug-in receiving means in which said first microprocessor is switched from operation in said dominant first mode to operation in said subservient second mode and transfers system preimmenance to said second microprocessor and in which said first microprocessor polls said keyboard, presents information to said second microprocessor, and responds to commands therefrom; and

clock means, coupled to said first and second microprocessors, providing a common periodic clock signal.

4,492,583

MEMBRANE TYPE COUPLINGS

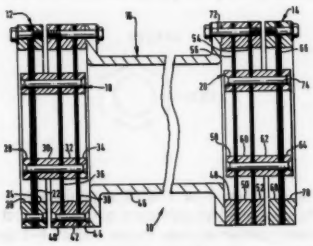
Norman J. Morrison, Bramhall, England, assignor to Flexibox Limited, Manchester, England

Filed Mar. 29, 1983, Ser. No. 480,371

Claims priority, application United Kingdom, Apr. 2, 1982, 8209933

Int. Cl.³ F16D 3/76, 3/78

U.S. Cl. 464—99 **6 Claims**



1. A rotary coupling comprising:

(a) an input and output member connectable to a driving and a driven shaft respectively;

(b) an intermediate member disposed concentrically with respect to the input and output members;

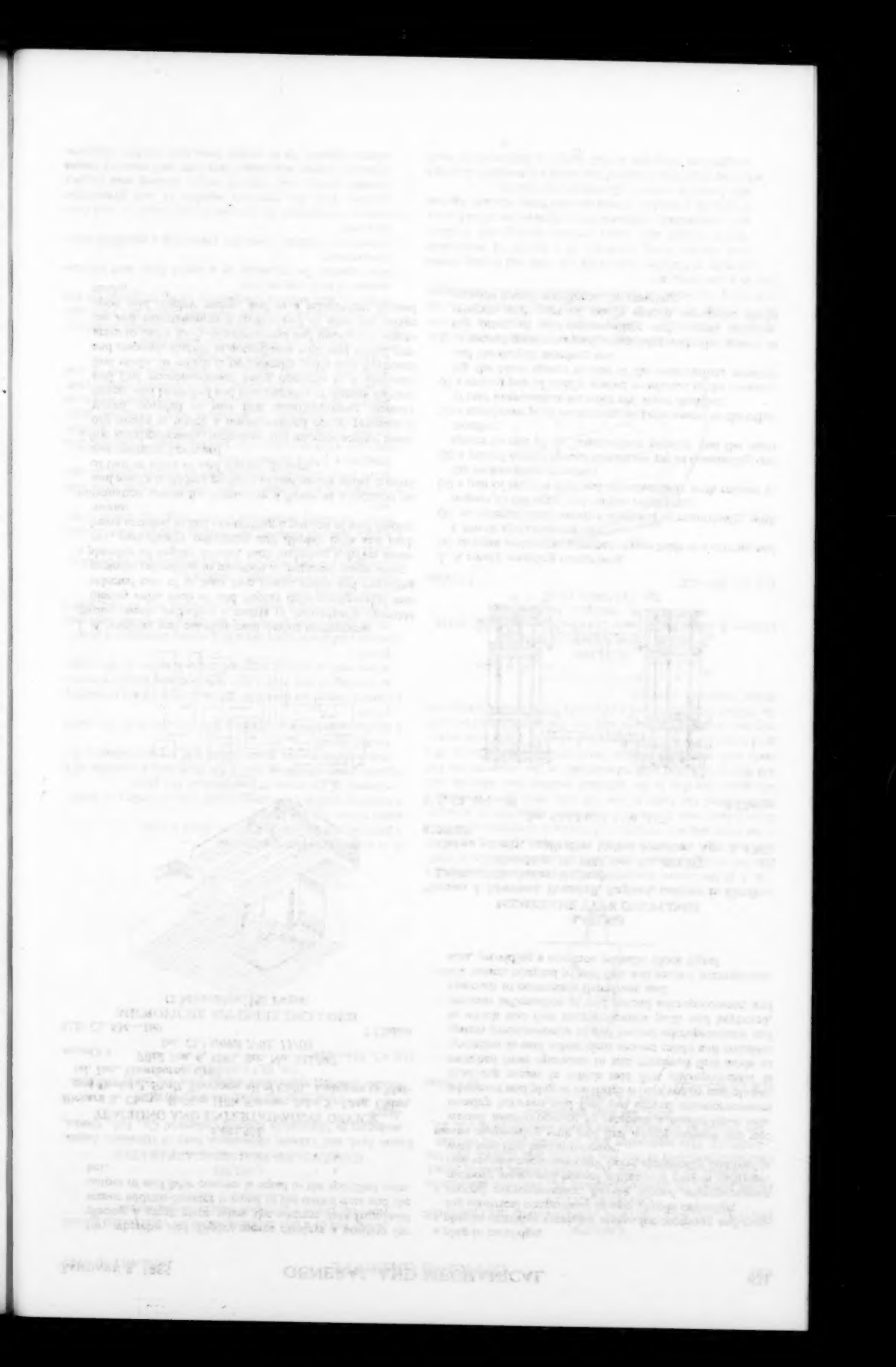
(c) a pair of spacers disposed concentrically with respect to the intermediate member;

(d) a pair of axially spaced membrane packs connecting one spacer to one of the intermediate member and the input member;

(e) a membrane pack connecting said one spacer to the other of said intermediate member and input member;

(f) a second pair of axially spaced membrane packs connecting the other spacer to one of the intermediate member and the output member; and

(g) a second membrane pack connecting said other spacer to the other of said intermediate and output member, wherein said pairs of axially spaced membrane packs provide lateral stability to the coupling.



4,492,584

TRANSFER PRINTING PROCESS FOR CELLULOSE FABRIC

Evans M. Jenkins, Thomasville, N.C., assignor to Apollo Chemical Corporation, Burlington, N.C.

Filed Aug. 19, 1982, Ser. No. 409,397
Int. Cl.[3] D06M *13/34*
U.S. Cl. 8—471 5 Claims

1. A method for heat transfer printing a disperse dye formulation from a transfer paper onto a textile fabric of the type composed of a natural and/or synthetic cellulosic material alone or in a blend with at least one natural and/or synthetic cellulosic material; said method comprising the steps of:

(a) impregnating said textile fabric with an aqueous solution of methylated trimethylol melamine reactant;

(b) polymerizing said methylated trimethylol melamine reactant in the total absence of any acidic or potentially acidic catalyst under such condtions that the reactant polymerizes within the fiberous structure of said fabric without substantially cross-linking said reactant to said fibers;

(c) said polymerizing step being carried out to according to one of the procedures selected from the group consisting of (1) subjecting the impregnated fabric to a steaming operation for at least thirty seconds, then drying at substantially 100° C. and curing at substantially 170° C.; and (2) maintaining the pH of said reactant during polymerization in the range of 8.5 to 10 by initially adding an alkaline catalyst selected from the group containing sodium hydroxide and potassium hydroxide to said aqueous solution, then subjecting said textile fabric to a drying operation at a temperature of substantially 80° C. and a subsequent curing operation at a temperature of substantially 170° C.;

(d) heat transfer printing onto said fabric.

4,492,585

PROCESS FOR THE ANTIFELTING TREATMENT OF KERATINOUS FIBRES, COMPRISING A BASIC OXIDATION CATALYZED BY A METAL SALT, AND FIBRES SO OBTAINED

Pierre Prevel, Caudebec-les-Elbeuf, France, assignor to Societe Normande de Recherches et de Participation, Louviers, France

Filed Jul. 5, 1983, Ser. No. 511,113
Claims priority, application France, Jul. 7, 1982, 82 11950
Int. Cl.[3] D06P *5/22;* D06L *3/02, 3/04;* D06M *3/22*
U.S. Cl. 8—493 12 Claims

1. A process for the antifelting treatment of keratinous fibres, comprising:

(1) freeing the keratinous fibres of their natural or foreign impurities by hot washing in a bath of purified water containing detergent agents in the presence of at least one metal ion sequestering agent and an alkali phosphate if necessary, emptying the bath and rinsing the keratinous fibres with purified water;

(2) treating the rinsed fibres thus obtained by a bath of purified water containing per 100 kg of material 0.4 to 1.6 moles (gram-molecules) of a water-soluble salt of a metal having several valencies chosen from the cupric salts, the ferrous salts, the aluminum salts and the titanium salts, having a pH of 3 to 4 obtained by addition of an organic acid, heated to a temperature of 60°1 to 70° C. with circulation of the bath for a sufficient period of time to achieve homogeneous fixing of the metal salt on the fibre, subsequently emptying the bath and rinsing the fibres with purified water;

(3) treating the rinsed fibres thus obtained with a bath of purified water in the presence of an oxidizing agent which does not introduce metal ions and an organic base to obtain a pH of 8.5 to 9, at a temperature of 45° to 50° C. for a time period of 1 hour 30 minutes to 2 hours, with the pH being maintained within the above-mentioned range by addition of the organic base, subsequently emptying the bath and rinsing the fibres with purified water;

(4) treating the rinsed fibres thus obtained with a bath of purified water containing a reducing agent which does not introduce metal ions and a sequestering agent, until the ingredients used in the treatment have been eliminated, subsequently emptying the bath and rinsing the fibres with purified water; and

(5) treating the fibres thus obtained with a bath of purified water having a pH of about 3 obtained by adding an organic acid, the fibres being subsequently either dyed directly or drained and dried.

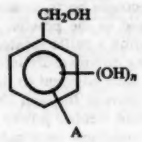
4,492,586

DYESTUFFS AND DYEING METHOD USING LIGNIN ADDUCT DISPERSANT

Stephen Y. Lin, Wausau, Wis., assignor to Reed Lignin, Inc., Greenwich, Conn.

Division of Ser. No. 123,696, Feb. 22, 1980, Pat. No. 4,308,203.
This application Jun. 25, 1981, Ser. No. 277,225
The portion of the term of this patent subsequent to Nov. 16, 1999, has been disclaimed.
Int. Cl.[3] D06P *67/00;* C07G *1/00*
U.S. Cl. 8—528 8 Claims

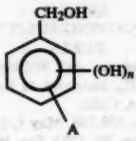
1. A dyestuff composition comprising a water-insoluble dye; and a lignin adduct of a methylolated derivative of a sulfonated lignin material containing about 2 to 8 percent by weight of combined organic sulfur, and about 0.05 to 4.0 millimoles, per gram of the lignin moiety of said material, of an hydroxyl benzyl alcohol compound having the general formula:



wherein n is an integer from 1 to 3 and A is a substituent selected from the group consisting of hydrogen, alkyl groups containing 1–4 carbon atoms and the hydroxymethyl group, said adduct being present in a weight ratio to said dye of from about 0.25 to 0.75:1.0.

7. In a method of dyeing a fabric, the stepe comprising:

a. forming a dye bath by admixing with water an effective amount of a dyestuff composition, said composition comprising: (1) a water-insoluble dye, and (2) a lignin adduct of a methylolated derivative of a sulfonated lignin material containing about 2 to 8 percent by weight of combined organic sulfur, and about 0.05 to 4.0 millimoles, per gram of the lignin moiety of said material, of an hydroxyl benzyl alcohol compound having the general formula:



wherein n is an integer from 1 to 3 and A is a substituent selected from the group consisting of hydrogen, alkyl groups containing 1–4 carbon atoms, and the hydroxymethyl group, said adduct being present in a weight ratio to said dye of from about 0.25 to 0.75:1.0, and the insoluble fraction of said dyestuff composition having a weight average particle size of about 50 to 200 angstroms;

b. heating said bath to a temperature of about 75° to 135° Centigrade;

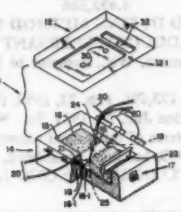
c. immersing a fabric in said bath for a period of time sufficient to effect dyeing thereof; and
d. removing said fabric from said bath.

4,492,587

METHOD OF FUSING VANADIUM PENTOXIDE POWDER

Michael B. Fletcher, Pretoria, South Africa, assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 113,098, Jan. 17, 1980, Pat. No. 4,337,373. This application Jun. 28, 1982, Ser. No. 392,661
Int. Cl.³ C01G 31/02
U.S. Cl. 23—293 R 9 Claims



1. A method for fusing vanadium pentoxide powder which comprises:
adding a charge of vanadium pentoxide powder to a furnace having walls provided with electrode ports and an overflow weir, the electrode ports containing electrodes having ends submerged in the powder charge, the furnace additionally including a baffle located upstream from the weir and projecting downwardly into the melt, the baffle providing a quiet zone adjacent to the weir;
passing an electric current through the melt by applying substantially constant electric power to the electrodes;
feeding additional vanadium pentoxide powder onto the surface of the melt within a zone separated from the weir by the baffle, the powder forming a thin solidified film on the surface of the melt;
allowing the vanadium pentoxide powder to build up as a layer on top of the thin solified film to a depth sufficient to provide an insulating blanket which limits the temperature of the air above the layer;
allowing excess melt to flow out of the furnace through the weir;
monitoring the temperature of the melt within the quiet zome adjacent to the weir; and
controlling the rate of feed of vanadium pentoxide powder so as to supply more or less powder to the melt in response to changes in the melt temperature in order to keep the temperature within predetermined limits.

4,492,588

METHOD FOR REMOVING SULFUR FROM FOSSIL FUELS

James G. Kralik, Pasadena, and William H. Corcoran, San Gabriel, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 259,736, May 1, 1981, abandoned. This application Sep. 29, 1983, Ser. No. 537,155
Int. Cl.³ C10L 9/06
U.S. Cl. 44—1 R 35 Claims

1. In a process for preparing a sulfur-containing fossil fuel for combustion: forming a basic and distributed precursor by subjecting the fuel for combustion to an oxidative treatment at approximately ambient temperature; and subjecting the oxidant-treated fuel to a basic aqueous solution of a compound of an alkali metal or an alkaline earth metal without substantially removing the sulfur from the fuel, whereby, upon combustion of the fuel, a major portion of the sulfur in the fuel will be trapped in the reaction with the precursor and appear in the resulting ash as a sulfate.

5. In a process as set forth in claim 1, wherein said fuel is peat.

49. An oxidatively treated fuel product comprising a sulfur-containing fuel exposed to an aqueous solution of a compound of a metal selected from the group including alkali metals and alkaline earth metals to form a basic and distributed precursor whereby a major portion of the sulfur in the fuel, when the fuel is burned, will be trapped as a sulfate in the ash.

4,492,589

ANIONIC DISPERSANTS FOR AQUEOUS SLURRIES OF CARBONACEOUS MATERIALS

Martin J. Schick, New York, N.Y., and Edwin L. Kelley, Succasunna, N.J., assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Sep. 20, 1982, Ser. No. 419,753
Int. Cl.³ C10L 1/32
U.S. Cl. 44—51 11 Claims

1. An aqueous carbonaceous slurry consisting essentially of carbonaceous material and water, the carbonaceous material of a size such that at least 80% will pass through a 200 mesh screen, containing at least one dispersant having the formula

$$[R^1OOC-CH_2-\underset{\displaystyle SO_3}{\underset{|}{CH}}-COOR^2]^-M^+$$

where R^1 and R^2 represent straight or branched chain alkyl groups having from about 4 to about 12 carbon atoms, R^1 and R^2 being the same or different, and M is a cation selected from the group consisting of sodium, potassium, lithium and ammonium
said dispersant present in an amount sufficient to reduce viscosity of the slurry, stabilize the network of carbonaceous material in water and improve pumpability.

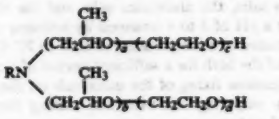
4,492,590

STABILIZERS FOR OIL SLURRIES OF CARBONACEOUS MATERIAL

Martin J. Schick, New York, N.Y., and Edwin L. Kelley, Succasunna, N.J., assignors to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Dec. 6, 1982, Ser. No. 447,315
Int. Cl.³ C10L 1/32
U.S. Cl. 44—51 18 Claims

1. A slurry of solid particulate carbonaceous material in oil containing at least one stabilizer having the formula



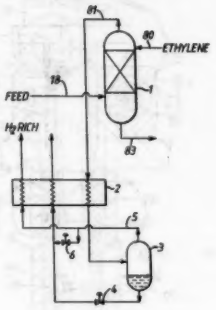
where R is a straight or branched saturated or unsaturated hydrocarbon chain of 12 to 18 carbon atoms,
a+b totals from about 2 to about 4 and
c+d totals from about 7 to about 22,
said stabilizer present in an amount sufficient to stabilize said slurry.

4,492,591

METHOD AND APPARATUS FOR RECOVERING HYDROGEN FROM A FEED COMPRISING METHANE, ETHYLENE, HYDROGEN AND ACETYLENE

Richard O'Reilly, Fetchem, England, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 24, 1982, Ser. No. 381,234
Claims priority, application United Kingdom, May 26, 1981, 8115934
Int. Cl.³ F25J 3/02
U.S. Cl. 62—17 8 Claims



1. A method for recovering hydrogen from a feed comprising methane, ethylene, hydrogen and acetylene, which method comprises the steps of cooling said feed; scrubbing said cooled feed with a scrubbing liquid selected from the group consisting of liquid ethylene, liquid propane, liquid ethane and mixtures thereof to absorb at least part of said acetylene; and subsequently further cooling the scrubbed feed to condense at least part of the methane and ethylene and leave a gaseous, substantially acetylene-free hydrogen product of a purity of up to greater than 96% by volume.

4,492,592

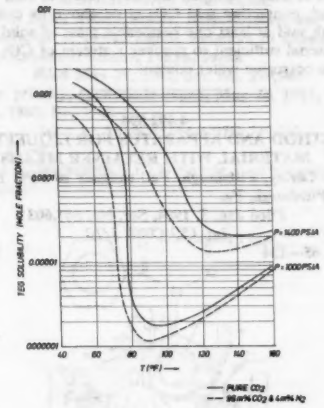
COMBINED DESICCATION OF SUBSTANTIALLY SUPERCRITICAL CO_2

Zaida Diaz, Houston, and James H. Miller, Katy, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 6, 1983, Ser. No. 501,583
Int. Cl.³ B01D 53/04
U.S. Cl. 62—18 5 Claims

1. A process for drying water-containing CO_2 at or above its critical point, comprising:

providing a two-component desiccant system, including at least one electrolyte desiccant adsorbed on a permeable mass of at least one solid desiccant material; said desiccant and desiccant material being preselected to maximize water removal, minimize desiccant loss and maximize drying efficiency; and



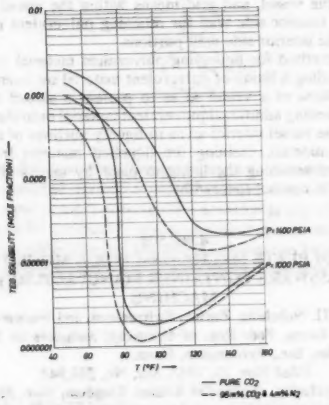
contacting said two-component system with CO_2 at or above its critical point to an extent sufficient to provide a CO_2 stream having a non-corrosive water content.

4,492,593

SEQUENTIAL LIQUID SOLID DESICCATION OF SUPERCRITICAL AND NEARCRITICAL CO2

Zaida Diaz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 6, 1983, Ser. No. 501,668
Int. Cl.³ F25J 3/00
U.S. Cl. 62—18 5 Claims



1. A process for drying water containing CO_2 at or above its critical point, comprising:

providing at least one liquid desiccant solution and at least one permeable mass of solid desiccant material for a two-step system;

preselecting each of said desiccants so that the volume of CO_2 desiccated to a selected non-corrosive water content in a single cycle with said two-step system is greater than the sum of the volumes which can be dried to the same extent by separate single cycles through said liquid desic-

cant solution or said permeable mass of solid desiccant material of said two cycle system;

contacting said CO_2 at or above its critical point, first with said at least one liquid desiccant solution, and;

second, contacting said CO_2 at or above its critical point with said at least one permeable mass of solid desiccant material sufficient to recover a stream of CO_2 with said non-corrosive water content.

4,492,594

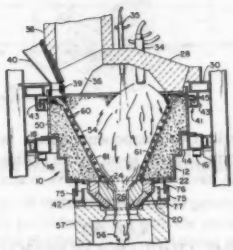
METHOD AND APPARATUS FOR LIQUEFYING MATERIAL WITH RETAINER MEANS

John E. Curley, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 3, 1984, Ser. No. 567,603

Int. Cl.³ C03B *5/10*

U.S. Cl. 65—134 **15 Claims**



1. Apparatus for liquefying pulverulent material comprising: a vessel having an interior side wall, means for heating the interior of the vessel to a liquefying temperature, outlet means at a bottom portion of the vessel for draining liquefied material from the vessel, inlet means at an upper portion of the vessel for feeding pulverulent material onto interior side wall portions of the vessel, and grid means within the vessel spaced from the interior side wall for retaining pulverulent material against the interior side wall portions.

10. A method for liquefying pulverulent material comprising: providing a lining of pulverulent material on interior side wall portions of a vessel so as to present a sloped melting surface, feeding additional pulverulent material onto the lining, heating the vessel interior so as to liquefy portions of the pulverulent material, draining the liquefied material from the vessel, and retaining the lining in place by means of a grid structure in contact therewith.

4,492,595

BOTTOM PLATE MECHANISM FOR A MOULD OF A GLASSWARE CONTAINER MANUFACTURING MACHINE

Hermann H. Nebelung, Zurich, Switzerland, and Werner-Dieter Knoth, Essen, Fed. Rep. of Germany, assignors to Emhart Industries, Inc., Farmington, Conn.

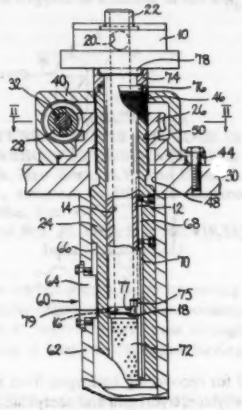
Filed Nov. 21, 1983, Ser. No. 553,942

Claims priority, application United Kingdom, Nov. 30, 1982, 8234098

Int. Cl.³ C03B *9/20*

U.S. Cl. 65—263 **8 Claims**

1. A bottom plate mechanism for a mould of a glassware container manufacturing machine comprising an adaptor plate which provides a support for one or more mould bottom plates and contains passages which connect an inlet of the adaptor plate to the or each bottom plate supported thereby so that, when vacuum is applied to the inlet, air is sucked from the or each bottom plate, connecting means on which the adaptor plate is mounted which connects the inlet to a vacuum source, a filter which serves to prevent particles sucked from the or each bottom plate from reaching the vacuum source, and height adjustment means operable to vary the height at which the adaptor plate is supported, the connecting means being arranged to maintain the connection between the inlet and the vacuum source as the height of the adaptor plate is varied, wherein the adaptor plate is supported by a vertically-extending tubular member of the connecting means which is supported for vertical adjustment by the height adjustment means, the tubular member being telescopically received in a fixed



duct of the connecting means leading to the vacuum source, and the adaptor plate comprises a cylindrical projection which is telescopically received in the tubular member and in which the inlet is formed within the tubular member, the filter being mounted on the cylindrical projection so that it extends across the inlet, the arrangement being such that the adaptor plate may be lifted away from the tubular member so that the cylindrical projection and filter leave the tubular member.

4,492,596

PHENYL-SUBSTITUTED SULFONAMIDES

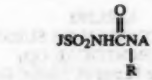
Robert J. Pasteris, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Aug. 11, 1982, Ser. No. 406,191

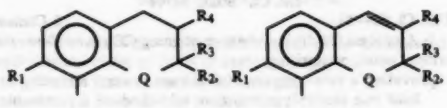
Int. Cl.³ C07D *407/12, 409/12*; A01N *43/54*

U.S. Cl. 71—90 **54 Claims**

1. A compound of the formula:

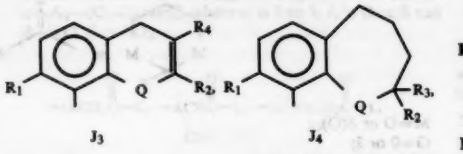


wherein J is

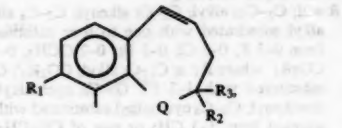


J_1 J_2

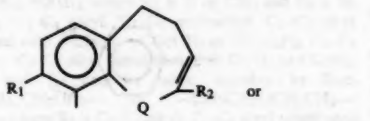
-continued



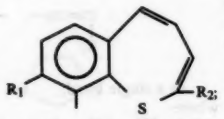
J_3 J_4



J_5

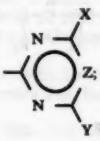


J_6 or



J_7

Q is O, S or SO_2;
R is H or CH_3;
R_1 is H, CH_3, OCH_3, Cl, Br, CO_2R_5, SO_2R_6, OSO_2R_7 or $SO_2NR_8R_9$;
R_4 is H or CH_3;
R_2 and R_3 are independently H or C_1–C_3 alkyl;
R_5 is C_1–C_3 alkyl, $CH_2CH{=}CH_2$, $CH_2CH_2OCH_3$ or CH_2CH_2Cl R_6 is C_1–C_3 alkyl;
R_7 is C_1–C_3 alkyl or CF_3;
R_8 and R_9 are independently C_1–C_2 alkyl;
A is



X is CH_3, OCH_3 or Cl;
Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, NH_2, $NHCH_3$ or $N(CH_3)_2$;
Z is CH;
and their agriculturally suitable salts; provided that:
(1) when X is Cl, then Y is OCH_3, NH_2, $NHCH_3$, $N(CH_3)_2$ or OC_2H_5;
(2) the total number of carbon atoms in R_2 and R_3 are less than or equal to 3;
(3) in Formula J_2, when R_2 and R_3 are other than H, then R_4 is H;
(4) in Formula J_3, when R_2 is other than H, then R_4 is H;
(5) when Q is S, then R_1 is not $SO_2NR_8R_9$;
(6) in Formulae J_3 and J_6, Q may not be O; and
(7) in Formula J_7, R_1 is not CH_3.

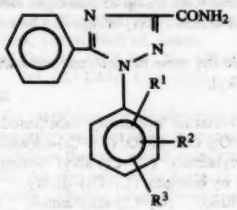
4,492,597

1,5-DIPHENYL DERIVATIVE OF 1,2,4-TRIAZOLE-3-CARBOXAMIDE AND HERBICIDE CONTAINING THE SAME

Katsumichi Aoki; Yoichi Kanda; Keigo Satake, and Hiroyasu Shinkawa, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

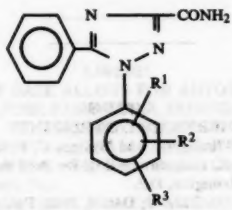
Filed May 19, 1982, Ser. No. 379,944
Claims priority, application Japan, May 25, 1981, 56-77967; May 25, 1981, 56-77968
Int. Cl.³ A01N *43/64*; C07D *249/10*
U.S. Cl. 71—92 **11 Claims**

1. A 1,5- disubstituted 1,2,4-triazole-3-carboxamide having the formula:



wherein R^1 is an atom of fluorine or chlorine, a methyl group or a trifluoromethyl group; R^2 is an atom of chlorine or a methyl group; and R^3 is an atom of hydrogen or a methyl group.

8. A herbicide composition comprising as an active ingredient a herbicidally effective amount of a 1,5-disubstituted 1,2,4-triazole-3-carboxamide represented by the formula:



wherein R^1 is an alkyl group having 1 to 3 carbon atoms, a trifluoromethyl group, a chlorine atom, fluorine atom, an iodine atom or a nitro group, R^2 is a methyl group or a chlorine atom and R^3 is a methyl group or a hydrogen atom, provided that 1-(4-methylphenyl)-5-phenyl-1,2,4-triazole-3-carboxamide is excluded, together with a herbicidally acceptable carrier or a diluent.

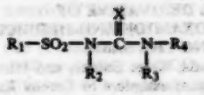
4,492,598

SULFONYLUREAS HAVING HETEROCYCLIC SUBSTITUENTS, AND THEIR USE IN AGRICULTURE

Lothar Willms, Unkel; Thomas Hüttelmaier; Hilmar Mildenberger, both of Kelkheim; Klaus Bauer, Rodgau; Helmut Bürstell, Frankfurt am Main, and Hermann Bieringer, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 6, 1982, Ser. No. 406,076
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1981, 3131489
Int. Cl.³ C07D *251/52, 251/46, 251/70*; A01N *43/70*
U.S. Cl. 71—93 **18 Claims**

1. A compound of the formula I



wherein

R_1 is a saturated cycloaliphatic radical having 3 to 12 C atoms or a cycloaliphatic radical having 5–12 C atoms, which is monounsaturated and all of which can optionally be substituted by up to 4 halogen atoms, $(C_1–C_4)$-alkyl, halogenoalkyl of 1–3 halogen atoms or $(C_1–C_4)$-alkoxycarbonyl; a bicyclic saturated or monounsaturated aliphatic radical having 7 to 12 C atoms,

optionally substituted by up to 6 halogen atoms or $(C_1–C_4)$-alkyl, or in which a CH_2 bridge can be replaced by oxygen,

R_2 and R_3 are the same or different and each may be H or $(C_1–C_4)$-alkyl,

X is O or S,

R_4 is a 1,3,5-triazine optionally substituted 1–2 times by halogen, NO_2, CN, CHO, $(C_1–C_4)$-alkylamino,

$(C_1–C_4)$-dialkylamino, $(C_1–C_4)$-alkyl which is optionally substituted by halogen, $(C_1–C_3)$-alkoxy,

$(C_1–C_3)$-alkylthio, $(C_1–C_3)$-alkylamino, $(C_1–C_3)$-dialkylamino $(C_1–C_4)$-alkoxycarbonyl, $(C_1–C_4)$-alkoxy which is optionally substituted by halogen or $(C_1–C_4)$-alkoxycarbonyl, or $(C_1–C_4)$-alkylthio which is optionally substituted by halogen or $(C_1–C_4)$-alkoxycarbonyl, or $(C_2–C_4)$-alkoxycarbonyl, and, if R_2 denotes hydrogen, its physiologically tolerated salt with base.

10. A herbicidal agent having an effective content of a compound as claimed in claim 1 in combination with a carrier therefor.

4,492,599

HERBICIDAL S-TRIAZINES

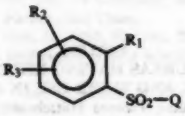
George Levitt, Wilmington, and Wallace C. Petersen, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 212,869, Dec. 4, 1980, Pat. No. 4,370,480, which is a continuation-in-part of Ser. No. 168,891, Jul. 17, 1980, abandoned, which is a continuation-in-part of Ser. No. 098,776, Nov. 30, 1979, abandoned. This application Sep. 27, 1982, Ser. No. 424,478

Int. Cl.³ C07D *251/46, 405/12*; A01N *43/68, 43/70*

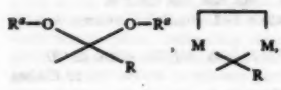
U.S. Cl. 71—93 26 Claims

11. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound selected from



where

R_1 is



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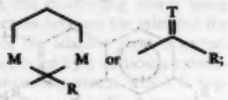
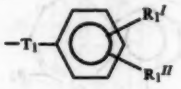


M=O or S(O)$_G$;

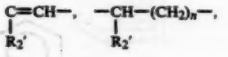
G=0 or 2;

R^a is CH_3 or CH_3CH_2;

R=H; $C_1–C_{12}$ alkyl; $C_2–C_6$ alkenyl; $C_2–C_6$ alkynyl; $C_1–C_4$ alkyl substituted with one to four substituents selected from 0–3 F, 0–3 Cl, 0–3 Br, 0–2 OCH_3, 0–1 cyano, 0–1 CO_2R_1' where R_1' is $C_1–C_3$ alkyl; CO_2R_1'; $C_2–C_4$ alkenyl substituted with 1–3 Cl; $C_3–C_6$ cycloalkyl; $C_5–C_6$ cycloalkenyl; $C_3–C_6$ cycloalkyl substituted with substituents selected from 1–3 CH_3 or one of CH_3CH_2, Cl, OCH_3; $C_4–C_7$ cycloalkylalkyl;



where T_1 is



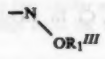
or a single bond;

where

R_2' is H or CH_3, n is 0 or 1;

R_1^I and R_1^{II} are independently H, CH_3, Cl or OCH_3;

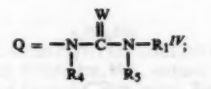
T=O or



where R_1^{III} is H, $C_1–C_4$ alkyl or $C_3–C_4$ alkenyl;

R_2=H, F, Cl, Br, $C_1–C_3$ alkyl, NO_2, SO_2CH_3, OCH_3, SCH_3, CF_3 or $N(CH_3)_2$;

R_3=H, F, Cl, Br or CH_3;

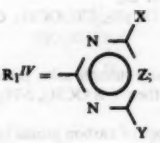


where

R_4=H or CH_3;

R_5=H, CH_3 or OCH_3;

W=O or S;



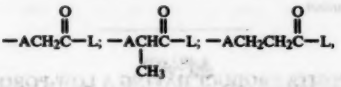
where

Z=N;

X=H, Cl, $-CH_3$, $-OCH_3$, $-OCH_2CH_3$ or $-OCH_2CH_2OCH_3$;

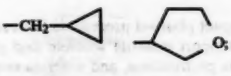
Y=H; Cl; $C_1–C_4$ alkyl; $C_1–C_4$ alkyl substituted with $-OCH_3$, $-OC_2H_5$, $-CN$, $-CO_2CH_3$, $-CO_2C_2H_5$ or

1-3 atoms of F, Cl, Br; C_3–C_4 alkenyl; $—CH_2C{=}CR_6$ where R_6 is H, $—CH_3$, $—CH_2Cl$; $—A—(CH_2)_{n'}—A_1—(C_1$–C_3 alkyl) where n' is 2 or 3, A is O or S and A_1 is O, S or SO_2;



where
L is OH, $—NH_2$,

$—NH(C_1$–C_4 alkyl), $—N(C_1$–C_4 alkyl)$_2$, C_1–C_6 alkoxy; SCN; $—N_3$; NR_7R_8 where R_7 is H or CH_3 and R_8 is H, $—OCH_3$, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_1–C_4 alkyl substituted with —CN or $—CO_2CH_3$ or $CO_2C_2H_5$, C_3–C_4 alkenyl or C_2–C_3 alkyl substituted with OCH_3 or OC_2H_5, or R_7 and R_8 can be taken together to form $—CH_2CH_2CH_2CH_2—$ or $—CH_2CH_2OCH_2CH_2—$; $—O—R_9$ where R_9 is C_1–C_4 alkyl, C_2–C_4 alkyl substituted with 1-3 atoms of F, Cl or Br, C_1–C_4 alkyl substituted with cyano, C_3–C_4 alkenyl, $—CH_2C{=}CR_6$, where R_6 is as previously defined,



$—SR_{10}$ where R_{10} is C_1–C_4 alkyl, C_1–C_2 alkyl substituted with CN, allyl or propargyl;

with the provisos that:

(1) when Y contains ≦4 carbon atoms, R contains ≦4 carbon atoms;

(2) when X is Cl, then Y is Cl;

(3) when X and Y are both H, then R is ≦4 carbon atoms;

(4) when T is $—N—OR_1{}^{III}$, then R contains ≦5 carbon atoms; and their agriculturally suitable salts and at least one of the following; surfactant, solid or liquid diluent.

4,492,600

CORROSION-INHIBITING PAINTS AND LACQUERS

Horst Brunn; Franz Hund; Wolfgang Rambold; Peter Kresse, and Gerd von Szadkowski, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 14, 1982, Ser. No. 398,226

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1981, 3128716

Int. Cl.³ C04B *9/02;* C09D *5/08*

U.S. Cl. 106—14.34 **1 Claim**

1. Corrosion-inhibiting paints and lacquers pigmented with a corrosion-inhibiting pigment having a specific surface according to BET of from 0.1 to 200 m^2/g, a content of water-soluble components of less than 0.6%, and comprising an organic corrosion inhibitor intercalated into an inorganic matrix having the formula:

$$x[Me(II)O] \cdot \frac{1-x}{2}\,[Me(III)_2O_3] \cdot y[A] \cdot z[I] \cdot aq$$

wherein

Me(II)O is at least one divalent metal oxide;

$ME(III)_2O_3$ is at least one trivalent metal oxide;

A is at least one inorganic acid anhydride;

I is at least one organic corrosion inhibitor;

aq is from 0.5 to 9 moles of water; and

x, y and z are whole or fractional numbers and

x has a value of from 0 to 1,

y has a value of from 0 to 0.7 and

z has a value of from greater than 0 to 0.4,

with the proviso that the organic corrosion inhibitor is at least 0.5% by weight of inorganic material.

4,492,601

PROCESS FOR CLARIFYING AND DESALINATING SUGAR CANE SYRUP OR MOLASSES

Seiken Nakasone; Sadao Miyagi, both of Okinawa; Takehiko Aragaki, Itoman, and Yasusi Higa, Naha, all of Japan, assignors to Daiichi Seito Kabushiki Kaisha, Okinawa and Taito Kabushiki Kaisha, Tokyo, both of, Japan

Filed Oct. 15, 1982, Ser. No. 434,484

Int. Cl.³ C13D *3/02, 3/16*

U.S. Cl. 127—48 **3 Claims**

1. A process for clarifying and desalinating raw cane sugar syrup or molasses solutions containing inorganic oxy-acid and organic acid impurities therein, which comprises the steps of (1) admixing with the raw cane sugar syrup or molasses solution a water-soluble chloride of an alkaline earth metal ion which reacts with inorganic oxy-acid anions and radicals and with organic acids to form a water-insoluble precipitate of said oxy-acid anions and radicals and organic acids, (2) separating said precipitate from said solution while maintaining the Brix degree of the solution between more than 60% and less than 80%, (3) diluting the precipitate-free solution to a Brix of less than 55%, and (4) subjecting said diluted solution to an electrodialysis using cation exchange film and neutral film arranged in an alternating manner.

4,492,602

COPPER BASE ALLOYS FOR AUTOMOTIVE RADIATOR FINS, ELECTRICAL CONNECTORS AND COMMUTATORS

Yung W. Lee; Fu W. Ling, both of Edison, and Stanley Shapiro, Hillside, all of N.J., assignors to Revere Copper and Brass, Inc., New York, N.Y.

Filed Jul. 13, 1983, Ser. No. 513,280

Int. Cl.³ C22C *9/02;* C22F *1/08*

U.S. Cl. 148—11.5 C **24 Claims**

1. A copper alloy composition having an improved anneal resistance and minimum electrical conductivity of 95% IACS consisting essentially of copper, oxygen, a sufficient amount of tin that is about 3.7 times the oxygen content plus about 0.025 to 0.08 weight percent, and 0.005 to 0.05 weight percent tellurium.

4,492,603

SEALING MATERIAL

Takashi Kuze, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 29, 1982, Ser. No. 428,057

Claims priority, application Japan, Sep. 8, 1982, 57-155184

Int. Cl.³ B32B *15/04, 15/18*

U.S. Cl. 148—31.5 **10 Claims**

1. A sealing material which comprises a soft glass-sealing alloy of an iron - nickel - chromium system consisting essentially of about 40 to 55% by weight of nickel, about 3 to 8% by weight of chromium, and the balance principally of iron, and an oxide layer formed on the surface thereof by a preoxidation treatment and having a sulfur content of not more than 15 ppm and a phosphorus content of not more than 20 ppm.

4,492,604

SALT BATH FOR NITRIDING IRON MATERIALS

Johannes Muller, Frankfurt am Main; Helmut Kunst, Rodenbach, and Christian Scondo, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Oct. 20, 1982, Ser. No. 435,401

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1981, 3142318

Int. Cl.³ C21D *1/48*

U.S. Cl. 148—15.5 24 Claims

1. A salt bath suitable for nitriding components made of iron and steel consisting essentially of at least one alkali metal cyanide, alkali metal cyanate and alkali metal carbonate and having a cyanide content of between 0.01 and 3% CN^- and also containing 0.5 to 12 ppm of selenium in the form of elemental selenium or a selenium compound.

4,492,605

METHOD OF MAKING PHOTOVOLTAIC DEVICE

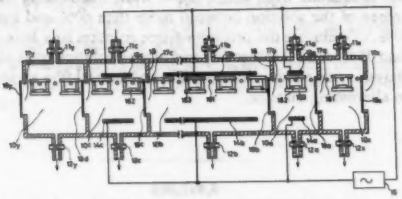
Shin-ichiro Ishihara, Hirakata; Takashi Hirao, Ikoma; Koshiro Mori, Osaka, and Motonori Mochizuki, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 18, 1983, Ser. No. 476,707

Claims priority, application Japan, Mar. 19, 1982, 57-44922

Int. Cl.³ C23C *13/10*; H01L *31/18*

U.S. Cl. 148—174 6 Claims



1. A method for making photovoltaic device comprising the steps of moving at least one substrate into a reaction chamber,

causing a plasma reaction of raw material gases in said reaction chamber, thereby forming an amorphous silicon layer of a first conductivity type on said substrate,

moving said at least one substrate into a next reaction chamber for a next plasma reaction,

causing said next plasma reaction of next raw material gases in said next reaction chamber, thereby forming a second amorphous silicon layer of a second conductivity type of said layer of the first conductivity type,

the improvement being in

after finishing said forming of said an amorphous silicon layer of a first conductivity type, changing the gas atmosphere of said reaction chamber into a different atmosphere which is substantially identical and of equal pressure to the next gas atmosphere of said next reaction chamber, and thereafter moving said substrate to said next reaction chamber.

3. A method for making a photovoltaic device comprising the steps of

moving at least one substrate into a reaction chamber,

causing a plasma reaction of raw material gases in said reaction chamber, thereby forming an amorphous silicon layer of a first conductivity type,

moving said at least one substrate into a next reaction chamber for a next plasma reaction, causing said next plasma reaction of next raw material gases in said next reaction chamber, thereby to form second amorphous silicon layer of a second conductivity type on said layer of the first conductivity type,

the improvement being in

after finishing said forming of said amorphous silicon layer of the first conductivity type, changing the next gas atmosphere of said next reaction chamber into another different atmosphere which is substantially identical and of equal pressure to the gas atmosphere of said reaction chamber, and thereafter moving said substrate to said next reaction chamber.

4,492,606

COMPOSITE PRODUCT HAVING A LOW-POROSITY SUPPORT LAYER, AND METHOD OF MANUFACTURE THEREOF

Laurent Haag, Wiltz, Luxembourg, assignor to Eurofloor S.A., Luxembourg, Luxembourg

Filed Sep. 1, 1982, Ser. No. 413,746

Claims priority, application Luxembourg, Sep. 2, 1981, 83602

Int. Cl.³ B32B *31/26*, *5/18*

U.S. Cl. 156—79 11 Claims

1. A process for the manufacture of a composite material having a low-porosity support layer, including the steps of:

perforating a low-porosity support material wherein said low-porosity support has perforations ranging in diameter from about 0.5 to about 3 mm, arranged in unit grid segments of from about 2 to about 20 mm in length on each side;

coating a compact plastisol precoat on both surfaces of said perforated support material wherein said plastisol essentially fills the perforations, and wherein said coatings are joined and locked together through said perforations;

gelling said precoat;

applying a foamable plastisol coating to the plastisol precoat on one surface of said support material; and

expanding the foamable coating.

4,492,607

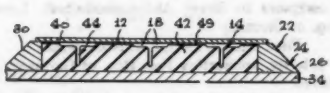
METHOD FOR PRODUCING INTEGRALLY STIFFENED FIBER REINFORCED PLASTIC PANELS

Ronald G. Halcomb, Tulsa, Okla., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 22, 1983, Ser. No. 468,101

Int. Cl.³ B29B *1/14*

U.S. Cl. 156—242 24 Claims



1. A process for producing an integrally stiffened panel comprising a skin of fiber reinforced resin containing T-section stiffeners of fiber reinforced resin, which comprises:

(a) producing a rubber-like form block having T-shaped grooves therein corresponding to the shape of said T-section stiffeners,

(b) inserting T-section stiffeners of fiber reinforced partially cured thermosetting resin into the grooves of said form block, said T-section stiffeners comprising a leg and outwardly extending flanges,

(c) introducing the resulting assembly of the form block and stiffeners into a die,

(d) placing a sheet of fiber reinforced partially cured thermosetting resin forming a skin over said form block and in contact with the flanges of said T-section stiffeners.

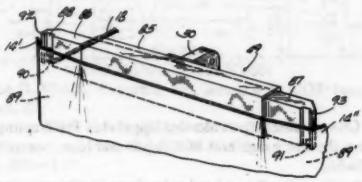
(e) and co-curing said stiffeners and said skin under heat and pressure to integrally connect said stiffeners to said skin.

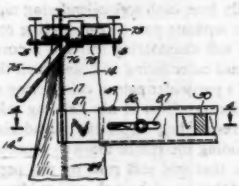
4,492,608

ELASTIC BAND APPLICATOR AND SHEET FOLDER

John L. Hirsch, Sheboygan Falls, and Ludwig W. Freitag, Elkhart Lake, both of Wis., assignors to Curt G. Joa, Inc., Sheboygan Falls, Wis.

Filed Jan. 6, 1983, Ser. No. 456,062
Int. Cl.³ B32B *31/00, 31/04;* B31F *5/00;* B29C *19/00*
U.S. Cl. 156—467 6 Claims





1. Apparatus for applying elastic bands to the laterally spaced apart margins of a longitudinally moving sheet, such as a sheet that is part of a diaper, comprising:

first and second parallel cylindrical members spaced apart in the longitudinal direction of the moving sheet, the second cylindrical member being located downstream of the first one and the sheet running in the same plane on the members under longitudinal tension,

shoe means extending laterally of the sheet and having a length from end-to-end that is less than the width of said sheet, said shoe means having a side for interfacing with the sheet and being positioned between the first and second cylindrical members for pressing against the sheet to deflect laterally extending central region of the sheet and put said region under lateral tension while letting opposite laterally spaced apart margins of the sheet beyond the ends of the shoe means remain free and untensioned,

nozzle means preceding said shoe means to apply longitudinally extending stripes of glue that are wider than the elastic bands to be attached to said margins of the sheet,

said side of the shoe means interfacing with said sheet having passageways wider than the glue stripes through which said glue stripes pass and into which said elastic bands, respectively, of lesser width than the glue stripes are fed onto said sheet over the glue stripes, and

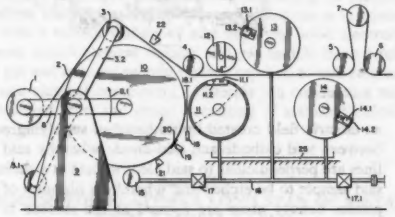
folding means next downstream from said shoe means, said folding means being constructed and arranged for folding said sheet margins over said glue stripes on the sheet to effect adhesion of the margins to the sheet with the glue stripe margins remaining on each side of the bands.

4,492,609

APPARATUS FOR SPLICING THE TRAILING END OF A WEB FROM AN EXHAUSTED SUPPLY ROLL TO THE LEADING END OF A WEB FROM A NEW SUPPLY ROLL

Friedrich Blom, Lengerich, Fed. Rep. of Germany, assignor to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Mar. 9, 1982, Ser. No. 356,650
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1981, 3109529
Int. Cl.³ G03D *15/04;* B31F *5/00;* B32B *31/00;* B26D *5/00*
U.S. Cl. 156—507 11 Claims



1. Apparatus for splicing the trailing end of a web from an exhausted supply roll to the leading end of a web from a new supply roll with the leading end having an outwardly facing adhesive, said apparatus comprising:

a cutter cylinder having a single cutter adapted for cutting through a web;

a backing cylinder;

a longitudinal sector-shaped portion on the periphery of said backing cylinder and aligned parallel to the axis of said backing cylinder, with suction holes for retaining the leading end of the new web behind the severing cut;

a first tape-applying cylinder, adapted to carry a tape which is adhesive on one side, and to apply the adhesive tape to the two webs at their abutting cut edges as they pass between the first tape applying cylinder and said backing cylinder;

means to move said backing cylinder into engagement with the new supply roll;

means for accelerating said new supply roll, said cutter cylinder and said backing cylinder to the same peripheral velocity as said exhausted supply roll;

controlling means for controlling the rotation of said backing cylinder and said new supply roll, so that said adhesive means engages said backing cylinder at a position other than at said sector-shaped portion, whereby a length of said leading end of said web is wrapped around the periphery of said backing cylinder and cut from the web of the new roll; and

means for moving the cutter cylinder and the first tape-applying cylinder into and out of engagement with the common backing cylinder.

4,492,610

DRY ETCHING METHOD AND DEVICE THEREFOR

Haruo Okano, Yokohama, and Yasuhiro Horiike, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 486,456, Apr. 25, 1983, abandoned, which is a continuation of Ser. No. 324,663, Nov. 24, 1981, abandoned. This application Dec. 12, 1983, Ser. No. 559,857
Claims priority, application Japan, Dec. 11, 1980, 55-173821; Sep. 25, 1981, 56-150801
Int. Cl.³ H01L *21/306;* B44C *1/22;* C03C *15/00;* C23F *1/02*
U.S. Cl. 156—643 13 Claims

1. A dry etching method comprising the steps of:

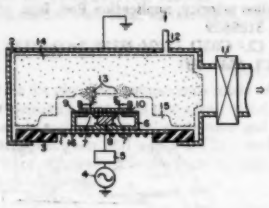
supplying power between a cathode and an anode;

generating a plasma of a reactive etchant gas containing halogen within a reaction chamber;

placing a sample composed of a layer to be etched and an etching mask formed thereon on said cathode;

etching said sample by ions attracted from said plasma toward said cathode;

inducing a magnetic field having field lines perpendicular to



an electric field created by said step of supplying power between said cathode and said anode whereby said field lines are perpendicular to said electric field at a surface of said sample to be etched and whereby a plurality of high plasma density areas are formed at the surface of said cathode which areas overlap each other.

4,492,611

EXTENDED NIP PRESS WITH MOVABLE SEALING STRIPS

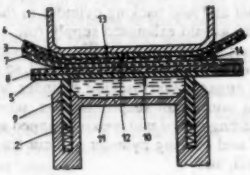
Paul O. Meinander, Osnabrück, Fed. Rep. of Germany, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Jul. 5, 1983, Ser. No. 510,877

Claims priority, application Finland, Jul. 13, 1982, 822482

Int. Cl.³ D21F *3/06*

U.S. Cl. 162—358 **3 Claims**



1. A press for removing liquid from a moving material web, comprising

two endless liquid impervious belts forming an extended press nip;

at least one liquid pervious belt which together with said material web travels through the nip;

a first beam provided with movable sealing strips at each end of the extended nip which together with the inner surface of one of said liquid impervious belts forms at least one pressure compartment for exerting pressure onto said material web in the nip along its entire width, wherein the movable sealing strips compensate for the deflection of the beams and the thickness of the moving material web;

a seond beam which is in contact with the inner surface of the other of the liquid impervious belts and is provided with a slide surface, said slide surface being essentially plane; and wherein the distance between said first beam and said second beam is adjustable.

4,492,612

APPARATUS FOR ON-MACHINE SUPERCALENDERING OF PAPER

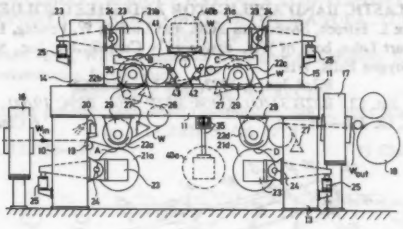
Reino Mataranen, Jyväskylä, Finland, assignor to Valmet OY, Finland

Filed May 21, 1981, Ser. No. 266,108

Claims priority, application Finland, May 22, 1980, 801666

Int. Cl.³ D21G *1/00*

U.S. Cl. 162—360.1 **15 Claims**



1. On-machine supercalender apparatus for treating a web leaving the discharge end of a paper machine, comprising:

a frame;

a plurality of soft and hard calendering rolls mounted to said frame defining a plurality of soft calendering nips arranged successively in the direction of the run of the web being calendered, the web run between the nips being substantially free, each soft calendering nip being formed by its own separate pair of calendering rolls including a respective soft calendering roll and a corresponding respective hard calendering roll, and such that each calender roll of a particular pair of calendering rolls forming a soft calendering nip is in nip defining relationship only with a corresponding respective calendering roll; and

means for guiding the run of the web successively through the nips so that said soft rolls do not participate in the guidance of the run of the web, said guiding means including the outer surfaces of said hard calendering rolls; and supporting arms on which said soft calendering rolls are journalled, each of said supporting arms being movably mounted to said frame for selective movement between a first position wherein said soft calendering roll journalled thereto is in nip defining relationship with a corresponding hard calendering roll and a second position wherein said soft roll is spaced from said corresponding hard roll, wherein the soft rolls can be removed without any web breakage.

4,492,613

RECOVERY OF COMPONENTS OF A BINARY AZEOTROPE

Gerald V. Wootton, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

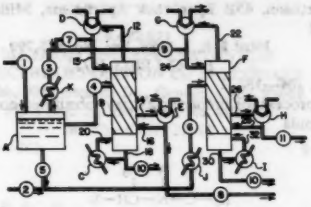
Filed Aug. 2, 1982, Ser. No. 404,157

Int. Cl.³ B01D *3/36*

U.S. Cl. 203—39 **14 Claims**

1. A process for the separation and recovery of methanol and cyclohexane liquids from a mixture of methanol and cyclohexane comprising the steps of introducing into a decanter vessel a condensed azeotrope of methanol and cyclohexane, separating the phases into upper and lower liquid phases by decantation in the decanter vessel, conveying each phase to a separate distillation column, distilling the azeotrope from the upper portion of each column, condensing the azeotrope from each column, returning the condensed azeotrope to the de-

canter vessel, and recovering methanol, the lower boiling liquid, from the lower portion of one column and cyclohexane,



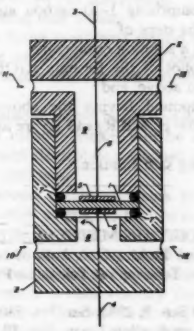
the higher boiling liquid, from the lower portion of the other column.

4,492,614

CHLORINE DETECTION

Lawrence B. Welsh, Evanston, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 8, 1983, Ser. No. 512,298
Int. Cl.³ G01N *27/58*
U.S. Cl. 204—1 T **12 Claims**



1. An apparatus for detection, in a gas sample containing a concentration of chlorine which is capable, in the presence of a catalytic agent, of dissociating to yield chloride ions, comprising:

(a) a sensor housing comprising a sample gas chamber and a reference gas chamber;

(b) an imporous solid electrolyte element partition separating said sample gas and said reference gas chamber having a first surface in common with said sample gas chamber and a second surface in common with said reference gas chamber, wherein said solid electrolyte element partition comprises a chloride ion conducting material selected from the group consisting of stannous chloride, barium chloride and lead chloride;

(c) a catalytic agent selected from the group consisting of platinum, palladium and alloys of platinum and palladium effective to promote dissociation and combination of said chloride ions in contact with said first surface in common with said sample gas chamber;

(d) a catalytic agent selected from the group consisting of platinum, palladium and alloys of platinum and palladium effective to promote dissociation and combination of said chloride ions in contact with said second surface in common with said reference gas chamber; and,

(e) means for forming an electrical connection in operative contact with said catalytic agent which is in contact with said first surface and said catalytic agent which is in contact with said second surface.

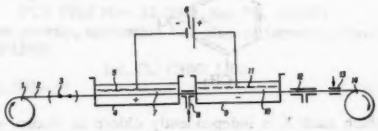
7. A method for detection, in a gas sample containing a concentration chlorine which is capable, in the presence of a catalytic agent, of dissociating to yield chloride ions, comprising contacting said gas sample with a first surface of an imporous solid electrolyte element and detecting an EMF between means for forming electrical connection with two separate portions of a catalytic agent effective to promote dissociation and combination, where a catalytic agent selected from the group consisting of platinum, palladium and alloys of platinum and palladium is in contact with said first surface and a catalytic agent selected from the group consisting of platinum, palladium and alloys of platinum and palladium is in connection with a second surface of said imporous solid electrolyte element, which element isolates said gas sample from a reference gas and has said second surface exposed to said reference gas, said element comprising a chloride ion conducting material selected from the group consisting of stannous chloride, barium chloride, and lead chloride.

4,492,615

PROCESS FOR PLATING A LONG SPAN OF METAL WITH A METAL LAYER

Jacques LeFebvre, Voiron, France, assignor to Aluminium Pechiney, Paris, France

Filed Apr. 18, 1983, Ser. No. 486,012
Claims priority, application France, Apr. 29, 1982, 82 07922
Int. Cl.³ C25D *7/06, 5/04, 5/44*
U.S. Cl. 204—28 **15 Claims**



1. A process for the continuous electrolytic plating of a long span of metal with an adhesive nickel layer, having a high line speed and low period of immersion in the electrolyte which comprises:

(a) submerging a long span of metal in a nickel plating solution, and

(b) applying an electric voltage to the nickel plating solution having said long span of metal submerged therein in such a manner that the positive terminal power supply is connected to said nickel plating solution and the negative terminal to a fluid electric connector, the passage of the current from one to the other being effected by the long span of metal, wherein said fluid electric connector comprises a solution of a nickel chloride, a fluoride and boric acid.

4,492,616

PROCESS FOR TREATING ALUMINUM OXIDE LAYERS AND USE IN THE MANUFACTURE OF OFFSET-PRINTING PLATES

Engelbert Pliefke, and Gerhard Usbeck, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 19, 1983, Ser. No. 524,591
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1982, 3232485
Int. Cl.³ C25D *11/16, 11/18*
U.S. Cl. 204—33 **6 Claims**

1. A process for using an offset printing plate comprising an aluminum or an aluminum alloy support subjected to (1) electrochemical roughening in an aqueous solution containing at least one of HCl and HNO_3; (2) anodic oxidation in an aqueous

solution containing at least one of H_2SO_4 and H_3PO_4; (3) treatment in an aqueous alkali metal silicate solution, wherein said solution comprises from about 0.5 to 10% by weight of alkali metal silicate; and thereafter (4) treatment in an aqueous solution comprising at least one alkaline earth metal salt, wherein said solution comprises from about 0.1 to 10% by weight of alkaline earth metal salt, thereby forming a hydrophilic layer on said surface, said process comprising the steps of:

(A) applying a radiation-sensitive coating to said support;

(B) imagewise exposing said coating; and thereafter

(C) developing said coating in an alkali developer, whereby said hydrophilic layer resists attack by said alkali developer.

4,492,617
METHOD OF PREPARING TETRAHALOBENZENE COMPOUNDS

Gwilym R. Davies, Kingsley, England, assignor to Imperial Chemical Industries PLC, London, England

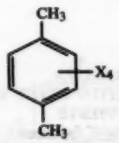
Filed Jan. 11, 1984, Ser. No. 569,898

Claims priority, application United Kingdom, Nov. 10, 1983, 8329956

Int. Cl.³ C25B *3/00*

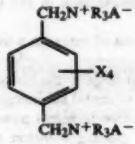
U.S. Cl. 204—73 R **3 Claims**

1. Method of preparing tetrahalobenzene compounds of the formula (IX):



(IX)

in which each X is independently chloro or fluoro, which comprises electrolysing in a protic medium a compound of the formula (IV):



(IV)

in which X has the meaning already given, each R is independently C_{1-4} alkyl and A is a radical capable of forming an anion A^-.

4,492,618
METHOD OF DISINFECTING WATER, IN PARTICULAR SWIMMING POOL WATER

Bernd Eder, Elsgruberstrasse 10, München 82, Fed. Rep. of Germany (8000)

Filed Feb. 14, 1984, Ser. No. 580,067

Int. Cl.³ C25B *1/00*

U.S. Cl. 204—152 **11 Claims**

1. A method of disinfecting water comprising the steps:

(a) immersing electrodes of a copper-silver alloy in the water,

(b) applying to the electrodes current from a direct current source and changing the polarity of the applied current at certain time intervals to produce copper and silver ions,

(c) and adding sodium persulfate to the water to oxidize organic substances present in the water.

4,492,619
PHOTOCHEMICAL PROCESS FOR PREPARING ALKOXY SUBSTITUTED COMPOUNDS

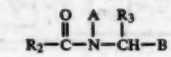
Xuan T. Phan, 2540 Valley Dr., Lancaster, Pa. 17603, and Paul J. Shannon, 45B Lynnbrook Apartments, Millersville, Pa. 17551

Filed Feb. 1, 1984, Ser. No. 575,799

Int. Cl.³ B01J *19/12*

U.S. Cl. 204—158 R **8 Claims**

1. A process for preparing alkoxy substituted compounds of the formula



(I)

where

A=H

B=OR_1

R_1=a primary alkyl group comprising 1-3 carbon atoms

R_2=a lower alkyl group comprising 1–6 carbon atoms, an alkoxy group comprising 1–6 carbon atoms, an aryloxy group, or an alicyclic group, and

R_3=H, a lower alkyl group comprising 1–6 carbon atoms, an alicyclic ring, a substituted aromatic ring, an unsubstituted aromatic ring and, where R_3 is other than H, combinations of these moieties,

provided that R_2 and R_3 taken together may be an alkylene chain comprising 1–10 carbon atoms, said process comprising the steps of

(1) preparing a solution comprising

(a) an alcohol of the formula R_1OH where R_1 is as described above, and

(b) a compound having the above formula where A=Cl, B=H, and R_2 and R_3 are as described above, and

(2) photolyzing said solution.

4,492,620
PLASMA DEPOSITION METHOD AND APPARATUS

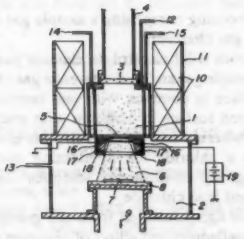
Seitaro Matsuo, and Toshiro Ono, both of Isehara, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Sep. 9, 1983, Ser. No. 530,671

Claims priority, application Japan, Sep. 10, 1982, 57-156843; Aug. 26, 1983, 58-155097

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 R **16 Claims**



1. A plasma deposition method comprising the steps of:

(a) introducing a gas into a vacuum vessel to produce a plasma stream of ions

(b) sputtering a target disposed about said plasma stream and made of a sputtering material by ions in (a) said plasma stream;

(c) ionizng atoms which are sputtered from said target into said plasma stream; and

(d) transporting the ionized atoms together with said plasma

stream to a specimen substrate so that said ionized atoms reach said specimen substrate to form a thin film including said sputtering material on said specimen substrate.

4,492,621

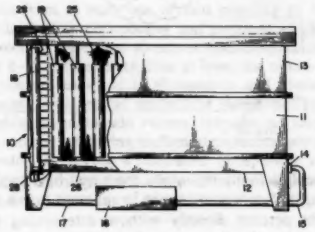
METHOD AND APPARATUS FOR ELECTRODEPOSITION OF MATERIALS

Paul R. Stubb, 3032 Stearns Dr., Orange, Calif. 92669

Filed Sep. 29, 1982, Ser. No. 427,849

Int. Cl.³ C25D *21/10*

U.S. Cl. 204—261 **9 Claims**



1. An electrodeposition cell comprising:
(a) a fluid containing tank means;
(b) anode means being positioned in said tank means such that said anode means will be at least partially submerged in an electrolyte contained in said cell when said cell is in operation;
(c) at least one cathode means positioned in said tank means such that said cathode means will be at least partially submerged in said electrolyte contained in said cell when said cell is in operation;
(d) means positioned within said tank means capable of confining a portion of said electrolyte in the area of said cathode, while at the same time permitting ions to pass therethrough and to be freely exchanged between said anode and cathode means when said cell is in operation;
(e) means to promote a high velocity flow of electrolyte parallel to the face of the cathode through the area around said cathode defined by said electrolyte confining means; and
(f) means to circulate said electrolyte into the confined area around said cathode to and from other areas of said fluid containing tank means.

4,492,622

CLARK CELL WITH HYDROPHYLIC POLYMER LAYER

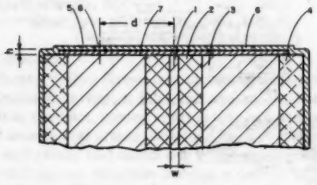
Martinus H. Kuypers, Veldhoven, Netherlands, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 2, 1983, Ser. No. 529,183

Claims priority, application European Patent Office, Sep. 3, 1982, 82108135.3

Int. Cl.³ G01N *27/30, 27/40*

U.S. Cl. 204—403 **9 Claims**



1. Electro-chemical cell for determining a particular property or component of a fluid comprising a cathode electrode (1) and spaced therefrom an anode electrode (3), whereat a space engaging said electrodes is adapted for being filled with an electrolyte,
and comprising a selectively permeable membrane (5) separating said electrodes and said space from the fluid characterized in that a thin layer (7) of hydrophylic polymer is provided between said membrane (5) and said electrodes (3, 4) covering at least the cathode (4);
that the membrane (5) has at least one hole (6) in it for allowing an electrolytic component of the fluid to enter said hydrophylic polymer layer (7);
and that the distance (d) between the hole(s) (6) and the cathode (1) is larger than the width (w) of the cathode (1).

4,492,623

PROCESS FOR THE HYDROGENATION OF COAL USING A SPLIT FEED

Helmut Würfel, Bliesakastel, Fed. Rep. of Germany, assignor to GfK Gesellschaft für Kohleverflüssigung mbH, Saarbruecken, Fed. Rep. of Germany

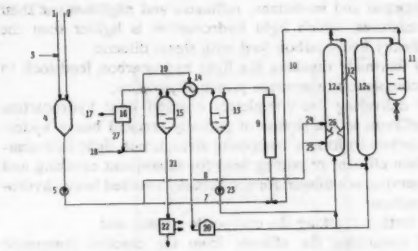
PCT No. PCT/DE81/00198, § 371 Date Jul. 13, 1982, § 102(e) Date Jul. 13, 1982, PCT Pub. No. WO82/01715, PCT Pub. Date May 27, 1982

PCT Filed Nov. 12, 1981, Ser. No. 403,651

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 3042984

Int. Cl.³ C10G *1/06*

U.S. Cl. 208—10 **6 Claims**



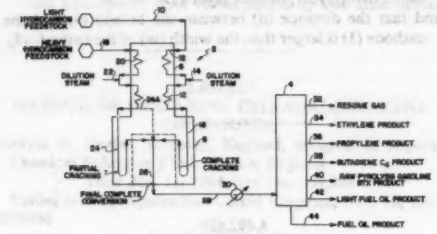
1. A process for the hydrogenation of coal comprising:
(1) forming a coal paste at a first temperature;
(2) pumping said paste to reaction pressure,
(3) dividing said paste into first and second portions wherein said first portion comprises about 50 to 70 wt. % of said coal paste;
(4) heating said first portion from said first temperature to about 400°–420° C., the initiation temperature of hydrogenation, by heat exchange with gaseous and vapor products;
(5) introducing the heated first portion into a lower region of a catalytic reaction zone and flowing said first stream upwardly thru said reaction zone wherein said first portion reacts exothermally and produces surplus heat; and
(6) introducing said second portion of coal paste at about said first temperature into said reaction zone above the introduction region of said first portion so that said second stream is heated to said hydrogenation initiation temperature by said surplus heat from said first stream reaction.

4,492,624

DUOCRACKING PROCESS FOR THE PRODUCTION OF OLEFINS FROM BOTH HEAVY AND LIGHT HYDROCARBONS

Axel R. Johnson, North Babylon, N.Y.; Swami Narayanan, Westwood, Mass., and Herman N. Woebcke, Stamford, Conn., assignors to Stone & Webster Engineering Corp., Boston, Mass.

Filed Sep. 30, 1982, Ser. No. 431,588
Int. Cl.³ C10G 9/14, 51/06
U.S. Cl. 208—78 6 Claims



1. A process for the thermal cracking of heavy hydrocarbon feed selected from the group consisting of naphtha, kerosene, atmospheric gas oil, vacuum gas oil and resid to produce olefins comprising:

(a) diluting the heavy hydrocarbon feed with steam in a ratio of 0.2 or less pound of steam per pound of heavy hydrocarbon;

(b) elevating the temperature of the heavy hydrocarbon with the steam diluent to a temperature to effect partial thermal cracking;

(c) mixing a stream of light hydrocarbon feedstock selected from the group consisting of ethane, propane, propylene, normal and iso-butane, raffinates and naphthas, or their mixtures, which light hydrocarbon is lighter than the heavy hydrocarbon feed with steam diluent;

(d) thermally cracking the light hydrocarbon feedstock to completion to produce principally olefins;

(e) delivering the completely cracked light hydrocarbon effluent to the stream of partially cracked heavy hydrocarbon to form a composite stream, said light hydrocarbon effluent providing heat for subsequent cracking and serving as a diluent for the partially cracked heavy hydrocarbon;

(f) further cracking the composite stream; and

(g) quenching the effluent from the cracked composite stream of heavy and light hydrocarbon to terminate the reactions.

4,492,625

DELAYED COKING PROCESS WITH SPLIT FRESH FEED

David E. Allan, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Nov. 17, 1983, Ser. No. 552,625
Int. Cl.³ C10G 9/14
U.S. Cl. 208—131 8 Claims

1. In a delayed coking process which comprises the steps of:

(a) preheating a hydrocarbonaceous oil chargestock to a coking temperature in a preheating zone;

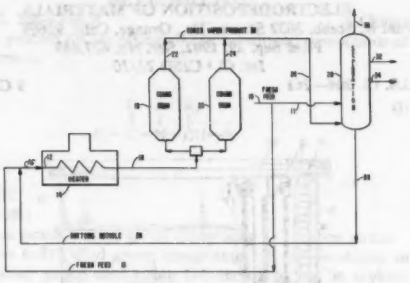
(b) introducing the resulting preheated oil chargestock into a coking zone at delayed coking conditions to form coke and a vapor phase product, including heavy and light hydrocarbon products;

(c) introducing said vapor phase product and a fresh hydrocarbonaceous oil into a separation zone;

(d) withdrawing a heavy bottoms fraction, including at least a portion of said heavy hydrocarbon products, from said separation zone, and

(e) recycling at least a portion of said withdrawn bottoms fraction to said preheating zone of step (a),

the improvement which comprises:



introducing a first portion of a fresh hydrocarbonaceous oil having a Conradson carbon content of at least about 5 weight percent directly without intervening treatment into said preheating zone of step (a) and introducing a second portion of said fresh hydrocarbonaceous oil into said separation zone of step (c).

4,492,626

HYDROFINING PROCESS FOR HYDROCARBON CONTAINING FEED STREAMS

Simon G. Kukes, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 11, 1984, Ser. No. 619,661
Int. Cl.³ C10G 45/00
U.S. Cl. 208—251 H 10 Claims

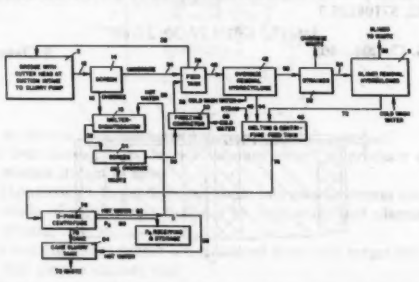
1. A process for hydrofining a hydrocarbon-containing feed stream comprising the step of contacting said hydrocarbon-containing feed stream under suitable hydrofining conditions with hydrogen and a catalyst composition consisting essentially of an alumina support, platinum and a promoter selected from the group consisting of scandium oxide, yttrium oxide, lanthanum oxide and oxides of elements of the lanthanide group, wherein the concentrations of platinum in said catalyst composition is at least about 0.3 weight percent based on the weight of said catalyst composition.

4,492,627

RECOVERY OF PHOSPHORUS FROM WASTE PONDS

David A. Crea, Pocatello, Id., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jun. 14, 1982, Ser. No. 387,911
Int. Cl.³ B03B 7/00, 1/02; B04C 5/24
U.S. Cl. 209—3 6 Claims



1. A process for recovering phosphorus from waste ponds

comprising dredging the waste pond to obtain an aqueous slurry containing comminuted, frozen phosphorus-containing particles, screening an oversized fraction containing particles larger than about 2 mm from an undersized portion in said slurry, feeding said undersized fraction into an initial hydrocyclone, removing a first underflow stream from said initial hydrocyclone having phosphorus-containing solids larger than about 500 micrometers, heating said first underflow stream to melt the phosphorus therein, removing a first overflow stream from said initial hydrocyclone having particles smaller than about 500 micrometers and introducing said first overflow stream into a plurality of hydrocyclones each having a diameter less than said initial hydrocyclone, removing a second overflow stream containing particles smaller than about 8–15 micrometers from at least one of said plurality of hydrocyclones diminished in phosphorus and enriched in slimes, removing a second underflow stream containing particles larger than about 8–15 micrometers from at least one of the plurality of hydrocyclones enriched in phosphorus and diminished in slimes, heating said second underflow stream sufficiently to melt the phosphorus in said stream, introducing said second underflow stream containing molten phosphorus into a centrifugal separator, removing a coalesced phosphorus stream as product from said separator, and a fraction of heavier dirt containing minor amounts of phosphorus as a waste stream.

4,492,628

METHOD OF TREATING CLAY TO IMPROVE ITS WHITENESS

Raymond H. Young; Horton H. Morris, both of Macon, and Robert L. Brooks, Gordon, all of Ga., assignors to Freeport Kaolin Company, New York, N.Y.

Filed Aug. 25, 1982, Ser. No. 411,588
Int. Cl.³ B03B *1/00*
U.S. Cl. 209—5 **19 Claims**

1. A method of treating clay to remove therefrom titanium mineral impurities, said method comprising the steps of:

(a) mixing said clay in the form of an aqueous slurry having a solids content of clay and said impurities of at least 20% by weight with a collector for the titanium mineral impurities, and an activator for the titanium mineral impurities comprising a water-soluble salt of a metal chosen from the alkaline earth metals and the heavy metals;

(b) conditioning the aqueous clay slurry at a solids content of at least 20% by weight for a time sufficient to dissipate therein at least 25 horsepower hours of energy per ton of solids at a pH below 7;

(c) mixing a polyacrylate salt deflocculant with the resulting conditioned aqueous clay slurry after conditioning;

(d) subjecting the resulting mixture of conditioned aqueous slurry having a solids content of at least 20 wt. % and the polyacrylate salt deflocculant to an air flotation process by passing air bubbles upwardly through the conditioned aqueous slurry and removing titanium mineral impurities with the froth; and

(e) recovering clay having a reduced titanium minerals impurities content.

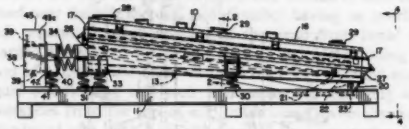
4,492,629

SIFTER STROKE SCREENING UNIT

George D. Dumbaugh, Louisville, Ky., assignor to Kinergy Corporation, Louisville, Ky.

Filed Jan. 28, 1983, Ser. No. 462,043
Int. Cl.³ B07B *1/38*
U.S. Cl. 209—332 **6 Claims**

1. A vibratory sifter screen unit including a sifter trough and screen structure having an inlet end and an outlet end downstream from the inlet, spaced apart spring isolators supporting the sifter trough and screen structure for free floating motion laterally and axially said outlet end being unsupported for free motion, said screen structure having a crown with its apex extending longitudinally on the axial center line of the screen structure, a vibratory drive assembly mounted on the structure at the inlet end, said assembly comprising a rotary motor and counterbalance mass mounted in spaced relation ahead of said inlet end on the longitudinal center line of the screen unit, springs supporting said assembly independently of the sifter trough and screen structure, and steel coil drive springs providing an operative connection between said assembly and the inlet end of the sifter screen unit and comprising the only driving connection therebetween, said motor having an eccentric weight imparting a generally elliptical vibratory motion to the unit adjacent the inlet end and exciting said drive springs to develop vibratory motion axially or linearly of the unit, said vibratory motion initially developing the generally elliptical motion of the sifter screen adjacent to the inlet end and diminishing gradually along the length of the sifter screen to a straight linear, axial motion adjacent to the outlet end of the screen structure.

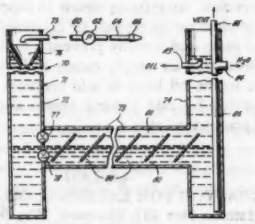


4,492,630

BILGE SYSTEM

Theodore R. Rymal, Jr., Conroe, Tex., assignor to Texas Oil Spill Control, Inc., Conroe, Tex.

Continuation-in-part of Ser. No. 308,932, Aug. 5, 1981, abandoned. This application Aug. 9, 1982, Ser. No. 406,443
Int. Cl.³ B01D *17/02*
U.S. Cl. 210—117 **4 Claims**



1. An oil/water separator comprising in combination:

a housing forming a pair of tanks connected by a passageway arranged between the top and bottom of said tanks;

an oil/water mixture inlet in one tank of said housing;

check valve means between said one tank and said passageway between said tanks to prevent said oil/water mixture from flowing back to said one tank from said passageway;

a plurality of baffles mounted at an angle with a space above and below each said baffle in said passageway between said tanks to permit fluid to flow about both the upper and lower ends of said baffles and therebetween;

an oil outlet from said other tank;

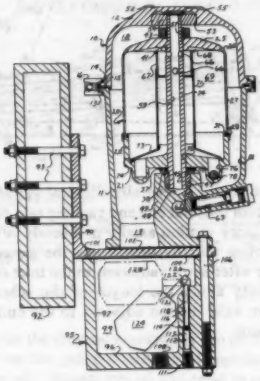
a water outlet from said other tank; and

the area of said passageway is one to two times as great as the area of said one tank, whereby an oil/water mixture fed into said one tank begins separating in said one tank and through a series of baffles dividing the oil from the water in said passageway for separate removal from said other tank.

4,492,631
CENTRIFUGAL SEPARATOR

H. Woods Martin, Houston, Tex., assignor to AE PLC, Warwickshire, England

Continuation of Ser. No. 340,884, Jan. 19, 1982, abandoned. This application Nov. 15, 1983, Ser. No. 551,510
Int. Cl.³ B01D *33/04*
U.S. Cl. 210—127 17 Claims



1. A centrifugal oil filter system for a machine having an oil pump adapted to supply oil under pressure and a sump, said filter including a casing defining a first chamber having an upper end and a lower end, a drain line between said chamber lower end and said sump, an oil pressure line connected between said oil pump and said casing, a rotor in said chamber upper end mounted for rotation about a substantially vertical axis and having an interior supplied with oil under pressure from said pressure line, said rotor having jets to discharge oil into said chamber and by reaction cause said rotor to rotate, the improvement comprising means to supply air under pressure to said chamber to replace air entrained in the oil returning to said sump and thereby prevent a build up of oil within said chamber, said air supply means including sensing means responsive to the oil level in said chamber lower end and a valve operated by said sensing means and connected to a source of pressurized air.

4,492,632
ADAPTOR FOR EXTERNAL OIL FILTER

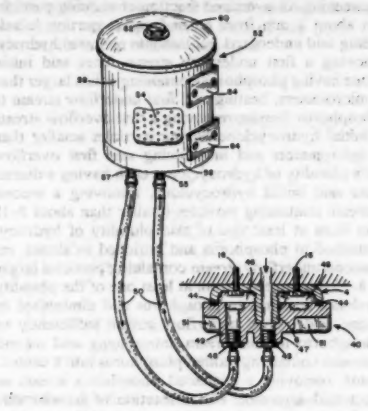
Fred P. Mattson, Box 207, Elmwood, Wis. 54740

Filed Dec. 16, 1983, Ser. No. 562,156
Int. Cl.³ B01D *27/08*; F01M *1/10*
U.S. Cl. 210—168 5 Claims

1. An oil filter adaptor assembly for an internal combustion engine having an internal oil pump and an external mounting member whereat a first bypass oil filter of a first capacity is normally attached, comprising:

a generally squat, cylindrical cast adaptor member having a threaded central bore formed therein for mounting about an externally threaded tubular spindle extending from said mounting member and through which unfiltered oil is directed from said engine, said adaptor member including an outlet port in fluid flow communication with an annular recess formed in said cast adaptor member and through which filtered oil flows to said engine, and said adaptor member further including a gasket extending from a surface of said adaptor member in surrounding relation to said recess for sealing against said mounting member upon threadably securing said bore to said spindle;

second bypass filter means of a capacity substantially greater than said first oil filter and remotely mounted from said adaptor member and including a replaceable oil filter cartridge for filtering the engine oil; and

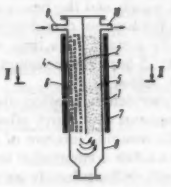


means for coupling dirty engine oil flowing through said central bore and spindle to said second bypass filter means and filtered oil back to said outlet port and said annular recess and thence to said engine.

4,492,633
SEPARATOR FOR SEPARATING FLUID MEDIA FROM MINUTE PARTICLES OF IMPURITIES

Alexandr V. Sandulyak; Vyacheslav I. Garaschenko, and Nikolai V. Yatskov, all of Rovno, U.S.S.R., assignors to Ukrainsky Ordena Druzhby Narodov Institut Inzhenerov Vodnogo Khozyaistva, U.S.S.R.

Filed Apr. 27, 1983, Ser. No. 488,998
Claims priority, application U.S.S.R., Feb. 26, 1982, 3402868
Int. Cl.³ B01D *35/06*
U.S. Cl. 210—223 7 Claims



1. A separator for separating a fluid medium from minute particles of impurities, comprising:

a housing,

a partition in said housing,

a first chamber and a second chamber defined in said housing by said partition,

a means defining space at an end of said housing which connects said chambers to each other,

a pipe means connected at a second end of said housing for feeding the fluid medium into said first chamber,

a second pipe means connected at the second end of said housing for discharging cleaned fluid medium from said second chamber,

a ferroelectric filtering packing contained in said first chamber,

a ferromagnetic filtering packing contained in said second chamber, and

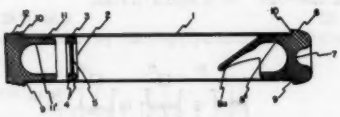
a magnetic system for producing a magnetic field in the zone of said housing through both said first and second chamber.

4,492,634

PRE-EVACUATED BLOOD COLLECTION TUBE WITH ANTI-HEMOLYSIS BAFFLE SYSTEM AND CENTRIFUGATION PROPELLED FILTRATION DISC AND EFFICIENT SERUM-FROM CELLS SEPARATOR

Antony-Euclid C. Villa-Real, Las Vegas, Nev., assignor to EMDE Medical Research, Reno, Nev.

Filed Sep. 28, 1982, Ser. No. 434,052
Int. Cl.³ B01D *33/00*
U.S. Cl. 210—398 7 Claims



1. An improved pre-evacuated blood sampling collection tube comprising:

a hollow tube having a first opening located at a first end thereof, a closed second end opposite said first end, and an interior surface;

a detachable first stopper mounted in said first opening, said first stopper including an outer wall adapted to make sealing engagement with said tube interior surface to seal said first opening and a baffle means formed integrally with said outer wall and projecting rearwardly and radially inwardly into said tube for deflecting blood against said interior surface of the tube; and

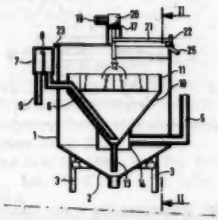
a filtration disc slideably mounted in said tube for axial motion therealong, said filtration disc oriented perpendicularly to the central axis of said tube and including sealing means thereon for maintaining sealing engagement with said tube interior surface during sliding motion of said filtration disc, said filtration disc operative to separate materials of different physical sizes.

4,492,635

DEVICE FOR SEPARATING SOLID SUBSTANCES FROM LIQUIDS

Ake Stigebrandt, Nygatan 30, Marstrand, Sweden

Filed Sep. 15, 1983, Ser. No. 532,529
Claims priority, application Sweden, Sep. 20, 1982, 8205380
Int. Cl.³ B01D *21/02*
U.S. Cl. 210—519 4 Claims



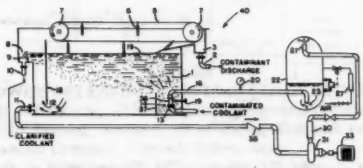
1. In a device for separating solid substances from a liquid, said substances having a density close to that of said liquid, particularly adapted for the extraction of fatty and protein-like substances from food processing water, and having a vessel provided at the top thereof with means for removal of solid substances collected on the surface of said liquid and at the bottom thereof with means for removal of settled residue, the improvement comprising an outer vessel, the lower portion of which is shaped in the form of an inverted cone, the apex of which is provided with means for discharging settled residue therefrom; an inner inverted conical receptacle concentrically disposed within said outer vessel and spaced from the bottom thereof, said inner receptacle being provided at the bottom thereof with means for discharging liquid downwardly from the apex of said inner receptacle near the discharge means of said outer vessel, the uppermost portion of said inner receptacle being open and provided with angularly spaced vertical partitions to impede rotary flow of liquid within said inner receptacle; inlet duct means for feed extending through said outer vessel and terminating near the base of said inner receptacle; an outlet duct for liquids extending from about the inside of the base of said inner receptacle, along the side wall thereof, through said inner receptacle and outer vessel and terminating at about the base of a chamber disposed outside of said outer vessel near the top thereof, said chamber having an overflow weir separating liquid introduced thereinto from liquid discharged therefrom, the height of said weir determining the level of liquid in said outer vessel; a duct for removing excess liquid overflowing said weir; and means for removing solid substances from the top of said outer vessel; whereby liquid introduced into the device is caused to flow upwardly along the outer surface of said inner receptacle and downwardly along the inner surface thereof to said outlet duct for liquids.

4,492,636

PROCESS FOR CLEANING METAL WORKING FLUIDS FOR RE-USE

John M. Burke, Kirtland, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 465,708, Feb. 11, 1983, abandoned, which is a continuation-in-part of Ser. No. 363,190, Mar. 29, 1982, abandoned, which is a continuation-in-part of Ser. No. 172,626, Jul. 28, 1980, abandoned. This application Jan. 20, 1984, Ser. No. 572,341
Int. Cl.³ B03D *1/02*
U.S. Cl. 210—706 6 Claims



1. In a continuous recycling process for removing suspended foreign matter including tramp oil from contaminated metal working fluid in an effective manner with little or no foaming and without removing or otherwise adversely affecting any oil or synthetic emulsions present in the fluid, said process comprising the steps of:

(a) providing a tank through which the metal working fluid is able to continuously flow, said tank having a mixing zone within the lower region thereof in which the contaminated metal working fluid and a saturated dissolved air solution are able to mix quiescently prior to formation of air bubbles within the solution,

(b) locating the tank in the process at a location that enables the tramp oil to enter the tank prior to the emulsification thereof by any emulsifying agents present in the fluid,

(c) introducing the metal working fluid into the mixing zone of the tank of step (a),

(d) dissolving air into a portion of the metal working fluid contained in a pressure vessel under sufficient pressure to provide a saturated dissolved air solution,

(e) introducing the pressurized saturated dissolved air solution of step (d) into said mixing zone of the tank of step (c) in such a manner that the solution is able to mix quiescently with the contaminated metal working fluid before the formation of air bubbles within the solution begins to occur,

(f) permitting the pressure on the saturated dissolved air

solution to lessen within the tank so as to enable the air to spontaneously nucleate and expand into a multitude of bubbles that adhere to and carry the foreign matter and tramp oil but not the emulsion upwardly through the metal working fluid to form a concentrated layer of the foreign matter and tramp oil in the upper level of the metal working fluid, and

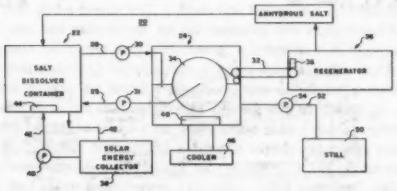
(g) removing the concentrate of step (f) from the metal working fluid.

4,492,637

WATER SEPARATION PROCESS

Luh C. Tao, Lincoln, Nebr., and James W. Blease, Rochester, N.Y., assignors to The Board of Regents of the University of Nebraska, Lincoln, Nebr.

Filed Nov. 25, 1983, Ser. No. 554,947
Int. Cl.³ B01D *9/02*
U.S. Cl. 210—711 **9 Claims**



1. A method of concentrating a dilute solution of ethanol in a sequence of stages in which the first stage comprises the steps of:

flowing said dilute solution of ethanol through a first container containing sodium sulfate;

maintaining the temperature of the first container at substantially thirty degrees centigrade while the dilute solution flows through it whereby said dilute solution dissolves the sodium sulfate;

flowing the dilute solution with the dissolved sodium sulfate into a second container;

maintaining the second container at substantially twenty degrees centigrade while the dilute solution flows through it, whereby the dissolved sodium sulfate precipitates out as hydrate crystals;

flowing the solution from the second container to the first container whereby the solution is repeatedly circulated between the first and second containers and back to the first container; and

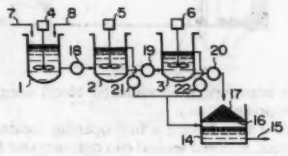
said circulating between the first and second containers and back to the first container including repeated steps until a dilute solution of ethanol with an initial concentration less than 15 percent by weight of ethanol in water has been circulated between the first and second containers in said first stage until the ethanol concentration by weight is increased to a value in excess of 45 percent, whereby the ethanol is concentrated using low quality energy in the first stage of the sequence of stages.

4,492,638

METHOD FOR AGGLOMERATING COAL PARTICLES IN PULP WATER

Kosai Hiratsuka; Yoichi Nakamura; Morihisa Maruko, all of Kudamatsu; Yoshio Matsuura, Funabashi, and Michio Kurihara, Chiba, all of Japan, assignors to Hitachi, Ltd. and Electric Power Development Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 317,984, Nov. 4, 1981, abandoned. This application Jun. 22, 1983, Ser. No. 506,871
Claims priority, application Japan, Nov. 7, 1980, 55-155971
Int. Cl.³ B01D *21/01*
U.S. Cl. 210—728 **6 Claims**



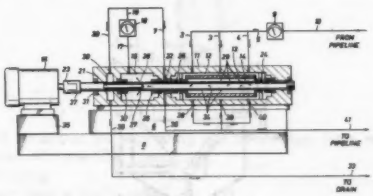
1. A method for agglomerating coal particles in pulp water of coal particles by agitating the pulp water in the presence of a binder, which comprises conducting agglomeration in at least three zones, the zones being in communication one after another, charging the pulp water and the binder only into a first zone, agitating the charged pulp water and binder while maintaining a coal concentration in the pulp water of 40% by weight or less in terms of the coal particles, transferring the pulp water together with the binder agitated in the first zone, to successive zones, one after another, and agitating the pulp water in each successive zone while removing water from the pulp water in each successive zone after the first zone, thereby increasing the coal concentration in the pulp water in each successive zone.

4,492,639

LEAK DETECTION

Thomas L. Stewart, Houston, and Florian C. Demny, Pasadena, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 22, 1984, Ser. No. 582,416
Int. Cl.³ B01D *17/02, 33/00*
U.S. Cl. 210—746 **8 Claims**



1. A process for measuring the water and sediment content of a wet stream which is predominantly non-aqueous, comprising, removing a sample of the wet stream, admitting the wet stream sample to an outer chamber containing an inner chamber having a wall formed of a filter, rotating the inner chamber while pressuring the wet stream sample from the outer chamber into the inner chamber, whereby sediment is filtered from the wet stream sample passing into the inner chamber and centrifugal force in the inner chamber forces water and sediment in the wet stream sample to remain in the outer chamber and thereby form a dry sample stream, passing the dry sample stream axially from the inner chamber to an aligned chamber which is separated and sealed from the outer chamber, periodically blocking the axial passage of the dry stream sample to the

aligned chamber, and checking the aligned chamber for leakage from the outer chamber.

4,492,640

TRIHYDROXYHYDROCARBYL SULFIDES AND LUBRICANTS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, and Joan M. Kaminski, Mullica Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 2, 1983, Ser. No. 463,223
Int. Cl.³ C10M 1/54
U.S. Cl. 252—46.3 25 Claims

1. A product made by reacting (1) a mixture of an alcohol of the formula

$$R(OR^1)_xOH$$

wherein R is a hydrocarbyl group containing 8 to 30 carbon atoms, R^1 is a C_2 to C_4 alkylene group and x is 0 to 10 and a hydroxysulfide of the formula

$$(HO)_yR^2SR^3(OH)_z$$

wherein R^2 is a C_6 to C_{30} hydrocarbyl group, R^3 is a C_2 to C_6 alkyl group, the sum of the carbon atoms of R^2 and R^3 being 8 to 36, y and z are 0 to 3, their sum being 3 with (2) a boron compound, the reaction being carried out at from about 90° C. to about 260° C. using the alcohol-hydroxysulfide mixture in a respective molar ratio of from about 4:1 to about 1:4 and sufficient boron compound to provide from about 0.1% to about 10% by weight of boron in said product.

4,492,641

PROCESS FOR THE CHIP FORMING, CUTTING OR ABRASIVE WORKING OF METALS

Hans Buchwald, Hanover, and Boleslaus Raschkowski, Wiedensahl, both of Fed. Rep. of Germany, assignors to Kali-Chemie AG, Hanover, Fed. Rep. of Germany

Filed Nov. 30, 1983, Ser. No. 556,393
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1982, 3244543
Int. Cl.³ C10M 1/30
U.S. Cl. 252—48.4 21 Claims

1. In a process for working of metals using a cooling lubricant containing a fluorochlorohydrocarbon, the improvement comprising said cooling lubricant comprising from about 0.5 to 25% by weight of an ester of a long chain carboxylic acid and a monoalcohol having a total of 34 to 50 carbon atoms, and/or a sulfochlorinated or sulfided derivative of said ester.

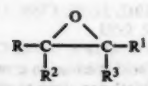
4,492,642

AMMONIATED BORATED EPOXIDES AND LUBRICANTS AND FUELS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 14, 1983, Ser. No. 504,116
Int. Cl.³ C10M 1/36, 1/54
U.S. Cl. 252—49.6 25 Claims

1. A product of reaction made by (1) reacting an epoxide of the formula



wherein R, R^1, R^2 and R^3 are hydrogen or C_1 to C_{30} hydrocarbyl groups, at least one of which is a hydrocarbyl group, with a nitrogen compound of the formula

$$(R^4)_aNX$$

wherein R^4 is hydrogen or a C_1 to C_3 hydrocarbyl group, X is hydrogen or hydroxyl, a being 2 when X is hydrogen or 4 when X is hydroxyl, and (2) reacting the material thus formed with a boron compound, reaction (1) being carried out at from about 60° C. to about 200° C. using from about 0.1 mole portion to about 1.0 mole portion of nitrogen compound per mole portion of epoxide, and reaction (2) being carried out at from about 80° C. to about 260° C. using sufficient boron compound to give a final product containing from about 0.1% by weight to about 10% by weight of boron.

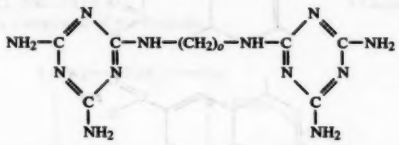
4,492,643

BISMELAMINE STABILIZERS

Peter Werle, Getnhausen; Holger Focke, Bruchköbel; Klaus Popp, Rodenbach, and Wolfgang Merk, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Nov. 1, 1982, Ser. No. 438,349
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3143920
Int. Cl.³ B01J 13/00; C09K 15/30; B01F 17/32
U.S. Cl. 252—311 13 Claims

1. An aqueous formaldehyde solution stabilized with a stabilizingly effective amount of an alkylene bismelamine of the formula



where o is an integer from 10 to 18.

4,492,644

SLOWLY RELEASING PERFUME COMPOSITIONS

Yuuichi Matsumoto, Abiko; Kiyomitsu Kawasaki, Noda, and Masato Ishitani, Kashiwa, all of Japan, assignors to Soda Aromatic Company, Limited, Tokyo, Japan

Filed Apr. 15, 1982, Ser. No. 368,520
Int. Cl.³ A61K 7/46
U.S. Cl. 252—522 A 4 Claims

1. A slowly releasing perfume composition prepared by mixing a granulated ethylene-vinyl acetate copolymer having a vinyl acetate content in the range of 19 to 40% by weight and a perfume, said perfume containing as an essential component at least one fragrant component selected from the group consisting of hydrocarbons and esters the total amount of said hydrocarbons and esters in said perfume being not less than about 30%, at a temperature in the range of about 10° C. to about 50° C. to thereby allow said perfume to be absorbed in said granulated copolymer and wherein the diameter of each granule of said granulated copolymer is in the range of about 1 to about 10 mm.

4,492,645

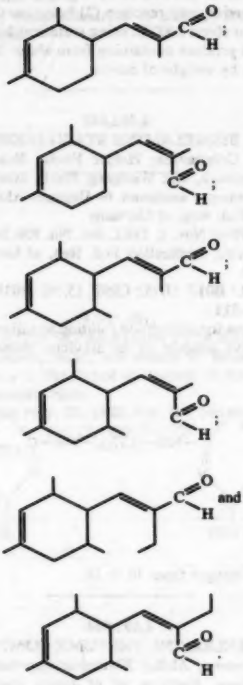
ORGANOLEPTIC USE OF CYCLOHEXENYL-ALPHA-ALKYL ACROLEIN DERIVATIVES

Mark A. Sprecker, Sea Bright, N.J.; Philip T. Klemarczyk, Newington, Conn., and Robert P. Belko, Woodbridge, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 398,953, Jul. 16, 1982, Pat. No. 4,424,379. This application Jun. 16, 1983, Ser. No. 505,423
Int. Cl.³ C11B 9/00
U.S. Cl. 252—522 R 15 Claims

1. A process for augmenting or enhancing the aroma of a

consumable material selected from the group consisting of perfume compositions, colognes and perfumed polymers comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of at least one aldehyde having a structure selected from the group consisting of:



4,492,646

LIQUID DISHWASHING DETERGENT CONTAINING ANIONIC SURFACTANT, SUDS STABILIZER AND HIGHLY ETHOXYLATED NONIONIC DRAINAGE PROMOTOR

John B. Welch, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 354,679, Mar. 4, 1982, abandoned, which is a continuation of Ser. No. 230,143, Jan. 31, 1981, abandoned, which is a continuation-in-part of Ser. No. 118,705, Feb. 5, 1980, abandoned. This application Feb. 22, 1984, Ser. No. 581,222

Int. Cl.³ C11D *1/722, 1/75, 1/83, 3/066*

U.S. Cl. 252—528 8 Claims

1. A liquid detergent composition comprising, by weight:

(a) from about 10% to about 50% of an anionic surfactant;

(b) from about 3% to about 8% of a drainage promoting nonionic surfactant selected from the group consisting of:

(i) an ethoxylated aliphatic alcohol of the formula

$$R(OC_2H_4)_nOH$$

wherein R is an aliphatic hydrocarbyl radical containing from about 16 to about 30 carbon atoms, and n is from about 16 to about 100;

(ii) an ethoxylated alkyl phenol of the formula

$$R(OC_2H_4)_nOH$$

wherein R is an alkyl phenyl radical containing a total of from about 18 to about 30 carbon atoms and at least one alkyl group containing at least about 12 carbon atoms, and n is from about 16 to about 100;

(iii) the condensation product of mono C_{16-22} fatty acid esters of polyglycols with from about 13 to about 100 moles of ethylene oxide per mole of the monoester;

(iv) the condensation product of cholesterol and from about 13 to about 100 moles of ethylene oxide;

(v) a material which is a condensate of ethylene oxide, propylene oxide and a compound containing hydroxy or amine groups onto which alkylene oxides can be polymerized, said polymer having a molecular weight of from about 500 to about 15,000, an ethylene oxide content of from about 30% to about 70% by weight and a propylene oxide content of from about 30% to about 70% by weight; and

(vi) mixtures thereof;

(c) from about 2% to about 8% of a suds stabilizing nonionic surfactant selected from the group consisting of amine oxides, ammonia, monoethanol and diethanol amides of fatty acids having an acyl moiety of from about 8 to about 18 carbon atoms, and mixtures thereof;

(d) from 0% to about 10% of a detergency builder selected from inorganic phosphates, polyphosphates, silicates and carbonates, organic carboxylates, phosphonates and mixtures thereof; and

(e) from about 20% to about 88% water.

4,492,647

ORGANOPOLYSILOXANES USEFUL AS DIELECTRIC FLUIDS AND ANTI-TREEING ADDITIVES

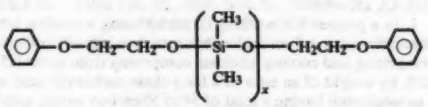
Harry Braus, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Feb. 1, 1984, Ser. No. 575,979

Int. Cl.³ H01B *3/30*

U.S. Cl. 252—573 6 Claims

1. A compound having the general structure:



wherein x is from about 3 to about 15 and mixtures thereof.

4,492,648

LIGHT-COLLECTING SYSTEMS USING HALOGENATED PERYLENE DERIVATIVES AS LIGHT CONVERTERS

Uwe Claussen, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengelsellschaft, Leverkusen, Fed. Rep. of Germany

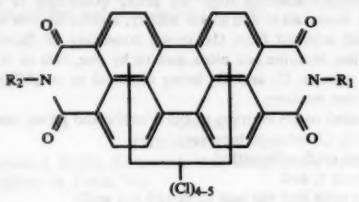
Filed Dec. 7, 1982, Ser. No. 447,545

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1981, 3149620

Int. Cl.³ C08K *5/00;* C09B *5/62;* H01L *31/02;* C09K *3/34, 11/06;* G02F *2/02, 9/33*

U.S. Cl. 252—582 7 Claims

1. In a light-collecting system comprising emission areas and absorption areas wherein the ratio of emission areas to absorption areas are 1:10 to 1:1,000, said light-collecting system comprising a transparent, optically usable plastic which contains centers capable of fluorescence, the improvement wherein said centers capable of fluorescence comprise a mixture of dyestuffs of the formula



(I)

in which R_1 and R_2 designate hydrogen, unsubstituted C_1–C_{18}-alkyl radicals or C_1–C_{18}-alkyl radicals substituted by C_1–C_{10}-alkoxy, C_1–C_{10}-alkylthio, halogen or cyano, and consisting of about 1 to about 20% by weight of the pentachloro derivatives and about 99 to about 80% by weight of the tetrachloro derivatives.

4,492,649

CARBON DIOXIDE REMOVAL METHOD EMPLOYING PACKED SOLID CALCIUM HYDROXIDE

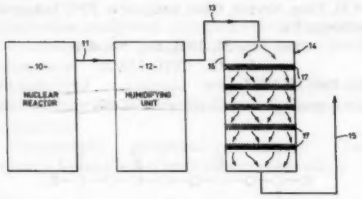
Christopher H. Cheh, 4239 Anworld Pl., Mississauga, Ontario, and Roger W. Glass, 2290 Wyandotte Dr., Oakville, Ontario, both of Canada

Filed Sep. 23, 1982, Ser. No. 422,479

Claims priority, application Canada, Jan. 15, 1982, 394275; Apr. 23, 1982, 401539

Int. Cl.³ G21F *9/02*; B01D *53/34*

U.S. Cl. 252—630 **10 Claims**



7. A method of removing and immobilizing carbon dioxide from a gas stream including carbon dioxide containing radioactive carbon as a constituent, which comprises providing a gas filter comprising a packed bed of solid $Ca(OH)_2$ prepared by hydrating CaO and drying, crushing and packing the resultant hydroxide, contacting the gas stream with water to raise its moisture content to a value corresponding to a relative humidity in the range 80%–100% at the temperature of the bed, and flowing the humidified gas stream through the gas filter to effect conversion of the calcium hydroxide to calcium carbonate.

4,492,650

A54556 ANTIBIOTICS AND PROCESS FOR PRODUCTION THEREOF

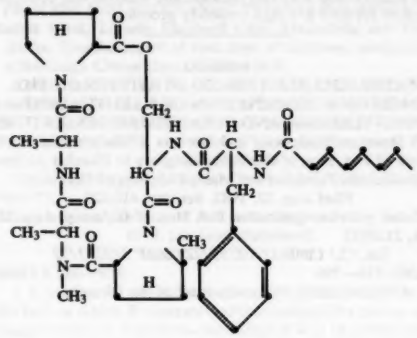
Karl H. Michel, and Ralph E. Kastner, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 27, 1982, Ser. No. 423,948

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **6 Claims**

1. A54556 Factor A, which has the structure



4,492,651

CYCLIC HEXAPEPTIDES

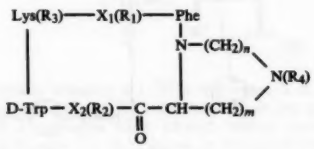
Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Nov. 23, 1983, Ser. No. 554,853

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 S **5 Claims**

1. A compound of the formula:



in which

X_1 is Thr, Val or Abu;

X_2 is Phe, Trp or Tyr;

n is one of the integers 2, 3 or 4;

m is one of the integers 1, 2, 3 or 4;

R_1 is hydrogen or a hydroxyl protecting group for Thr;

R_2 is hydrogen or a hydroxyl protecting group for Tyr;

R_3 is hydrogen or a N^{ϵ} protecting group for Lys;

R_4 is hydrogen, alkanoyl of 2 to 6 carbon atoms, aroyl of 7 to 10 carbon atoms or an amino protecting group,

or a pharmaceutically acceptable salt thereof.

4,492,652

REACTIONS OF AROMATIC COMPOUNDS HAVING TWO OR MORE FUSED RINGS

Martin L. Kaplan, Morris Plains, N.J., assignor to AT&T Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 104,159, Dec. 17, 1979, abandoned. This application Jan. 31, 1983, Ser. No. 462,405

Int. Cl.³ C07C *1/253*, *1/32*

U.S. Cl. 568—75 **8 Claims**

5. A process for the production of a carbon containing body comprising the steps of pyrolyzing a carbon containing compound and collecting a reaction product from said pyrolysis characterized in that said carbon containing compound comprises an aromatic organic compound having fused aromatic rings which, due to said pyrolysis at a temperature in the range from 700 to 1200 degrees C., forms free radicals at the peri positions of said fused rings of said carbon containing compound, wherein said free radicals are formed due to said pyrolysis through the production of a stable inorganic gas by removal of a substituent from said peri positions of said compound without the destruction of said fused aromatic rings,

wherein sulfur is the only agent present during said pyrolysis step which reacts with said radicals, and wherein said collected reaction product is a high volatility product.

4,492,653

WATER-SOLUBLE TRISAZO DYESTUFFS ON THE BASIS OF A COMBINATION OF NAPHTHALENE-, DIPHENYLAMINE- AND PYRAZOLONE DERIVATIVES

Karl Sommer, Königstein, and Norbert Armbrecht, Sulzbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

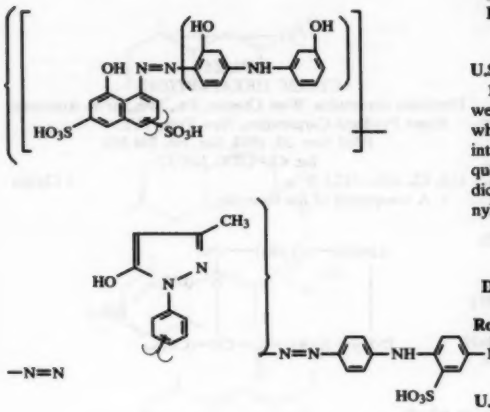
Filed Aug. 23, 1982, Ser. No. 410,621

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1981, 3133552

Int. Cl.³ C09B *31/02, 33/22*; D06P *3/30, 3/32*

U.S. Cl. 534—796 **1 Claim**

1. A water-soluble trisazo-dyestuff of the formula



4,492,654

WATER-SOLUBLE AZO COMPOUNDS, A PROCESS FOR THEIR PREPARATION AND THEIR USE AS DYES

Ernst Hoyer, Frankfurt am Main; Folker Kohlhaas, Hochheim am Main, and Fritz Meininger, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

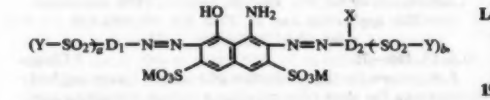
Continuation of Ser. No. 279,735, Jul. 2, 1981, abandoned. This application Jul. 20, 1983, Ser. No. 515,442

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1980, 3025572

Int. Cl.³ C09B *33/02, 31/02*

U.S. Cl. 534—827 **10 Claims**

1. A disazo compound of the formula



in which

M is hydrogen or an alkali metal;

D_1 is the benzene or naphthalene nucleus unsubstituted or, apart from the group Y—SO_2—, substituted by one or two substituents selected from the group consisting of fluorine, chlorine, bromine, carboxy, lower alkyl, lower alkoxy and nitro, and/or by one, two or three sulfo groups;

D_2 is the benzene or naphthalene nucleus substituted by X defined below, unsubstituted or substituted by the group —SO_2—Y and unsubstituted or substituted by one or two substituents selected from the group consisting of carboxy, lower alkyl and lower alkoxy, and/or by one substituent selected from the group consisting of fluorine, chlorine, bromine and nitro, and/or by one, two or three sulfo groups, D_1 and D_2 being identical to or different from one another;

X is bonded to D_2 in ortho-position to the azo group and is fluorine, chlorine or bromine;

Y is vinyl or β-sulfatoethyl;

a is zero or 1; and

b is zero or 1; and the sum of (a+b) is 1 or 2.

4,492,655

TRICYCLOPENTADIENYL CERIUM AND PROCESS FOR PREPARING THE SAME

Peter S. Gradeff, Pottersville, and Fred G. Schreiber, Highland Park, both of N.J., assignors to Rhone-Poulenc, Inc., New Brunswick, N.J.

Filed Apr. 27, 1984, Ser. No. 604,756

Int. Cl.³ C07F *5/00*

U.S. Cl. 260—429.2 **11 Claims**

1. A process for preparing tricyclopentadienyl cerium as well as the mono and dicyclopentadienyl cerium intermediates which comprises slowly adding alkali metal cyclopentadienide into a solution of ceric ammonium nitrate, forming, in sequence, and stepwise, monocyclopentadienyl cerium dinitrate, dicyclopentadienyl cerium mononitrate, and tricyclopentadienyl cerium.

4,492,656

DICYANOMETHYL ETHYL PEROXY DICARBONATE POLYMERIZATION INITIATORS

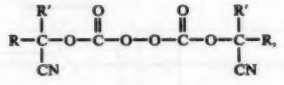
Robert H. Tang, Norton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 30, 1982, Ser. No. 430,167

Int. Cl.³ C07C *179/20*

U.S. Cl. 260—453 RZ **4 Claims**

1. An organic peroxydicarbonate of the graphic formula:



wherein R and R′ are each selected from the group consisting of C_1–C_4 alkyl, C_5–C_7 cycloalkyl, and C_1–C_4 alkyl-substituted C_5–C_7 cycloalkyl, or participate in a cycloalkyl group of from 5 to 7 carbon atoms, provided that when one of R and R′ is each individually a cycloalkyl group, the other is a C_1–C_4 alkyl.

4,492,657

IMINES OF ALKYL 4-HALOMETHYLBENZOATES

Lorenz Heiss, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

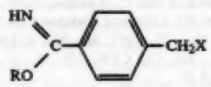
Filed Apr. 25, 1983, Ser. No. 488,126

Claims priority, application Fed. Rep. of Germany, May 5, 1982, 3216722

Int. Cl.³ C07C *119/20*

U.S. Cl. 260—453.7 **1 Claim**

1. An alkyl (4-halomethyl)iminobenzoate of the formula



and its HCl or HBr salts, R denoting C_1–C_4-alkyl or C_1–C_4-alkoxymethyl and X denoting Cl or Br.

4,492,658

THIOUREYLENES

Thomas J. Bellos, Kirkwood, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Jul. 21, 1980, Ser. No. 170,326

Int. Cl.³ C07C *155/00, 157/00, 87/02*

U.S. Cl. 260—455 A **5 Claims**

1. A thioureylene derived from reacting an oxyalkylated polyamine with Thiourea.

4,492,659

PHOSPHOLIPID COMPOUND

Elmar Bosies, Weinheim; Rudi Gall, Hirschberg; Günter Weimann, Weinheim-Lützelsachsen; Uwe Bicker, Lorsch, and Wulf Pahlke, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jul. 7, 1982, Ser. No. 395,954

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1981, 3127503

Int. Cl.³ C07F *9/02*

U.S. Cl. 260—925 **6 Claims**

1. Phospholipid compound, designated (2-ethyl-1-octadecyloxy-3-propyl)-(2-trimethylammonium-ethyl) phosphate.

2. Phospholipid compound, designated (2-methoxymethyl-2-methyl-1-octadecyloxy-3-propyl)-(2-trimethylammonium-ethyl) phosphate.

3. Phospholipid compound, designated (2,2-bis-methoxymethyl-1-hexadecyloxy-3-propyl)-(2-trimethylammonium-ethyl) phosphate.

4. Phospholipid compound designated (2-allyl-1-octadecyloxy-3-propyl)-(2-trimethylammonium-ethyl) phosphate.

5. Phospholipid compound designated [1-hexadecyloxy-2-(2-propynyl)-3-propyl]-(2-trimethylammonium-ethyl) phosphate.

4,492,660

LOW TEMPERATURE STABLE TERT-BUTYLPHENYL DIPHENYL PHOSPHATE

Silvio L. Giolito, Whitestone, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 279,389, Jul. 1, 1981, Pat. No. 4,414,161. This application Sep. 6, 1983, Ser. No. 529,466

Int. Cl.³ C07F *9/09*

U.S. Cl. 260—966 **4 Claims**

1. A low temperature, stable tert-butylphenyl diphenyl phosphate product which will not crystallize at temperatures of about 0° C., comprised of mixed meta/para isomers produced by (a) alkylating a phenol with isobutylene to produce a predominantly para-tert-butylphenol and (b) catalytically isomerizing the para-tert-butylphenol to produce a meta/para isomerized tert-butylphenol mixture; then (c) realkylating the isomerized tert-butylphenol mixture to obtain a desired C_4/ϕ ratio; and (d) phosphorylating the realkylated tert-butylphenol with a phosphorylating agent to produce a tert-butylphenyl diphenyl product characterized by low temperature stability.

4,492,661

PROCESS FOR PRODUCING TRIARYLPHOSPHITES

Rudolf Maul, Lorsch; Eberhard Otto, Lindenfels, and Horst Zinke, Ernsthofen, all of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 307,474, Oct. 1, 1981, Pat. No. 4,440,696, which is a continuation of Ser. No. 103,132, Dec. 13, 1979, Pat. No. 4,312,818, which is a continuation of Ser. No. 928,644, Jul. 27, 1978, abandoned. This application Jul. 5, 1983, Ser. No. 510,706

Claims priority, application Switzerland, Aug. 8, 1977, 9691/77

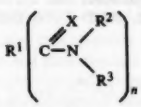
The portion of the term of this patent subsequent to Jan. 26, 1999, has been disclaimed.

Int. Cl.³ C07F *9/141*

U.S. Cl. 260—976 **5 Claims**

1. A process for producing a triaryl phosphite of the formula $(RO)_3P$, in which R represents aryl substituted by one or more straight-chain or branched-chain alkyl of 4 to 18 carbon atoms in the ortho position, cycloalkyl, aryl or aralkyl groups in the 2- or 2,4-positions, by reaction of a phosphorus trihalide with a hydroxy-substituted aromatic compound of the formula ROH in the presence or absence of a solvent, and in the presence of 0.005 to 10 mol %, relative to the hydroxy-substituted aromatic compound, of a catalyst selected from the group consisting of

(a) an amide of a carboxylic acid of the formula



in which, where n is 1, R^1 is hydrogen, X is an oxygen atom; and R^2 and R^3 independently of one another are each a hydrogen atom, phenyl, benzyl, cyclohexyl or alkyl having 1 to 12 C atoms, or R^2 and R^3 together are alkylene which is optionally interrupted by O or S atoms.

4,492,662

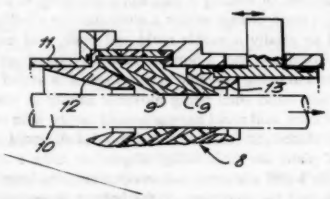
MANUFACTURE OF INSULATED ELECTRIC CABLES

Christopher Larrive, Southampton, England, assignor to Pirelli General plc, London, England

Filed Apr. 28, 1983, Ser. No. 489,475

Int. Cl.³ B29F *3/10*

U.S. Cl. 264—40.1 **16 Claims**



1. Apparatus for curing an extruded insulation layer of an electric cable, comprising a tube for the through-passage of the insulated electric cable, which tube is formed at least in part as a catenary, means for filling said tube with a heated fluid for effecting curing of the cable insulation layer, and cable restraining means at the exit end of the curing tube, or adjacent said exit end and within the curing tube, for applying to the cable insulation a restraining force directed oppositely to forces developed by the hydrostatic pressure of the curing fluid which tend to extrude the cable through the exit end of the curing tube, so as to nullify the effects of such forces, said cable restraining means comprising flexible means in sliding engagement with said cable insulation and adjustable means for

pressing said flexible means toward said cable and thereby varying the restraining force on said cable.

6. A method of curing an extruded insulation layer of an electric cable, comprising passing the insulated electric cable along a catenary path through a curing tube which conforms generally to said catenary path, filling said curing tube with a heated fluid for effecting curing of the cable insulation layer, applying to the cable, at the exit end of the curing tube or adjacent said exit end and within the curing tube, a restraining force applied by sliding friction to the cable and opposing the forces developed by the hydrostatic pressure of the curing fluid which tend to extrude the cable through the exit end of the curing tube, and varying said frictional restraining force as the cable is passed through the curing tube so as to nullify the effects of the forces developed by the hydrostatic pressure of the curing fluid.

4,492,663

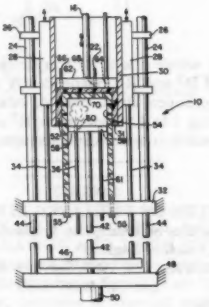
METHOD AND ADJUSTABLE LENGTH MOLD FOR MANUFACTURING A FOAMED PACKAGING ASSEMBLY

Nyles V. Reinfeld, P.O. Box 2321, Bath, Ohio 44240, and Michael J. Valentine, 78 Tower Rd., Pines Lake, Wayne, N.J. 07470

Continuation-in-part of Ser. No. 338,471, Jan. 11, 1982, abandoned. This application Jan. 10, 1983, Ser. No. 456,595

Int. Cl.³ B29D *27/00*; B15B *3/02*

U.S. Cl. 264—45.4 **19 Claims**



1. A method of making a packaging assembly in an adjustable length mold formed within a mold shell by a hollow mold core and an axially movable mold end plate, said mold core having a fixed position, a bottom plate positioned within said mold core and being movable axially thereof in sealed relation thereto, said mold shell being movable axially in relation to said mold core, said mold having a mold cavity with one open end and a closed end formed by said mold shell, mold core and mold end plate, the mold being adapted to make a container having side walls, a bottom and an open end, the length of the side walls and the thickness of the bottom being adjustable, comprising the steps of:

adjusting the axial position of the mold shell in relation to the mold core to adjust the side wall length of the container;

forming a closed mold cavity by moving said mold end plate axially into said mold shell a desired distance to place it in spaced relation to an end of said mold core to control the thickness of the bottom of the container to be formed;

filling the mold cavity with expandable thermoplastic beads; and

heating the plastic material to expand it into a mass including a container having a bottom of a predetermined thickness and side walls of a predetermined length.

4,492,664

PROCESS FOR THE CONTINUOUS FOAMING OF PLASTICS

Mellé Bruno, Via Lampugnano 144, I-20151 Milan, Italy

Filed Jan. 4, 1983, Ser. No. 455,580

Claims priority, application Italy, Jan. 18, 1982, 67046 A/82

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—46.2 **9 Claims**

1. In a process for the continuous foaming of plastics, comprising the steps of pouring a foaming mixture into a foaming space, of letting said mixture foam and solidify in said foaming space, of limiting said foaming space by means of flexible bands and of guiding and moving said flexible bands so as to follow the corresponding surfaces of the material being foamed and solidified, the improvement that as flexible band a composite web is used, which is formed by a support paper band and a very thin impermeable band of plastic material detachably coupled to said paper band and disposed between said paper band and said material being foamed and solidified.

4,492,665

PROCESS FOR THE PRODUCTION OF MOULDINGS FROM MATERIALS BASED ON SILICON NITRIDE

Robert Pompe, Moelndal, Sweden, assignor to Swedish Institute for Silicate Research, Goeteborg, Sweden

PCT No. PCT/SE82/00161, § 371 Date Jan. 21, 1983, § 102(e) Date Jan. 21, 1983, PCT Pub. No. WO82/04245, PCT Pub. Date Dec. 9, 1982

PCT Filed May 10, 1982, Ser. No. 463,884

Claims priority, application Sweden, May 25, 1981, 8103269

Int. Cl.³ C01B *21/68*; C04B *35/58*

U.S. Cl. 264—65 **7 Claims**

1. A process for the production of moulded bodies consisting of materials based on silicon nitride comprising preparing a powder mix of silicon powder, silicon nitride powder and a sintering aid, moulding said mix, nitriding the Si-content to Si_3N_4 and sintering, characterised in that the silicon powder is ground down to a mean particle size below 1 μm in the presence of silicon nitride powder as a dispersing agent and in the presence of sintering aids and, that a body moulded of this powder mix hereafter is nitrided during a time period not longer than 5 (five) hours whereby the nitriding temperature is kept below the melting point of pure silicon.

4,492,666

METHOD FOR FORMING A PROTECTIVE PIPE CAP

Wilfried Dreyfuss, Dorfstrasse 52, D-3111 Elmke, Fed. Rep. of Germany; Thomas E. Remp, Jr., 5555 Del Monte Dr., Houston, Tex. 77056, and Kurt Müller, Muhlenweg 58, 3101 Eicklingen, Fed. Rep. of Germany

Filed Mar. 31, 1982, Ser. No. 364,474

Int. Cl.³ B29C *5/00*, *6/04*

U.S. Cl. 264—261 **10 Claims**

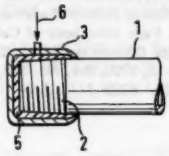
1. A method of manufacturing a protective device for threads on an end of a pipe, said threads defining a corrugated surface, comprising:

mounting a mold around said threads to provide a cavity between said threads and said mold, said cavity being unfilled;

inserting an elongate tear element into said cavity between said mold and said threads; and

filling said cavity with polyurethane by injecting said poly-

urethane into said cavity under pressure to form a protective covering for said threads and forming a tear-open lug



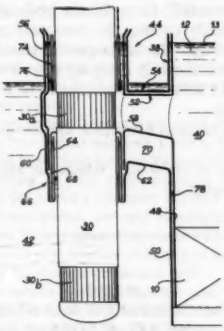
on said protective covering, said protective covering engaging said threads and being substantially adjacent said corrugated surface of said threads.

4,492,667

FAST NEUTRON NUCLEAR REACTOR

Marie-Thérèse Cabrillat, Pertuis, and Noël Lions, Manosque, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 25, 1982, Ser. No. 381,894
Claims priority, application France, May 27, 1981, 81 10565
Int. Cl.³ G21C *15/00*
U.S. Cl. 376—405 **4 Claims**



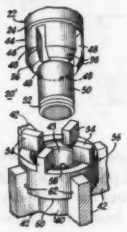
1. A fast neutron nuclear reactor comprising a vertically axed main vessel sealed in its upper part by a slab and containing the core of the reactor and a volume of liquid cooling metal for the latter, an inner cylindrical vessel defining within the main vessel a hot collector overhanging the core and a cold annular collector, at least one heat exchanger and at least one primary pump suspended on the slab and disposed in the cold collector for respectively ensuring the cooling of the liquid metal contained in the hot collector and its circulation between the hot and cold collectors, and connecting means making it possible to pass the liquid metal contained in the hot collector up to an inlet port of the exchanger, the inner vessel incorporating an inner cylindrical ferrule and an outer cylindrical ferrule arranged in a coaxial manner, the connecting means comprising a cold outer structure supported by the outer ferrule and comprising a first ferrule which is concentric to the exchanger and whose lower end is sealingly connected thereto below the inlet port, and a hot inner structure supported by the inner ferrule and comprising a second ferrule concentric to the exchanger and placed within the first ferrule, wherein the first ferrule is open at its upper end above the free level of the liquid metal contained in the main vessel and wherein the second ferrule is open at its two ends located respectively above the free level of the liquid metal contained in the vessel and below the inlet port of the exchanger, and wherein the hot inner structure, the cold outer structure and the heat exchanger are spaced apart from one another, the hot inner structure passing the liquid metal contained in the hot collector to the inlet port of the exchanger and forming a heat baffle, whereas the cold outer structure ensures sealing between the hot collector and the cold collector.

4,492,668

APPARATUS AND METHOD FOR PREVENTING THE ROTATION OF RODS USED IN NUCLEAR FUEL ASSEMBLIES

Lawrence G. Pilgrim, Jr., and Leigh F. Jackson, both of Greensburg, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 8, 1982, Ser. No. 366,819
Int. Cl.³ G21C *23/00*
U.S. Cl. 376—440 **3 Claims**



1. An improved nuclear fuel assembly having a plurality of elongated rods with an end plug disposed at least at one longitudinal end of each of said rods and having at least one tie plate with a plurality of circumferentially enclosed cylindrical tie plate sleeves with one of said tie plate sleeves having a circumferentially enclosed internal cavity for receipt therethrough of one of said end plugs of one of said elongated rods, wherein the improvement comprises:

(a) said one tie plate sleeve having a circumferential outer surface and an elongated out-of-cavity flat on an end portion of said outer surface; and

(b) said one end plug having a stud portion disposable in said internal cavity of said one tie plate sleeve and having a cylindrical body portion disposed between said one elongated rod and said stud portion, said cylindrical body portion including a longitudinally extending, internal flat portion on the stud-portion-facing end of said cylindrical body portion, with said internal flat portion seatable against and surroundably engageable with said out-of-cavity flat to prevent rotation of said one elongated rod about its longitudinal axis when said stud portion of said one end plug is disposed in said internal cavity of said one tie plate sleeve.

4,492,669

METHOD AND MEANS FOR MAKING A BERYLLIUM MIRROR

Gerald Gould, Bethel, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 21, 1983, Ser. No. 476,945
Int. Cl.³ B22F *3/14, 7/06*
U.S. Cl. 419—5 **2 Claims**

1. A process for forming a monolithic mirror from fine powder comprising the steps of;

(a) providing an open container,

(b) placing a plurality of hollow, hexagonal shaped elements in said container,

(c) precisely spacing each of said hexagonal shaped elements from one another by pins disposed in recesses through alternate surfaces of said hexagonal shaped elements,

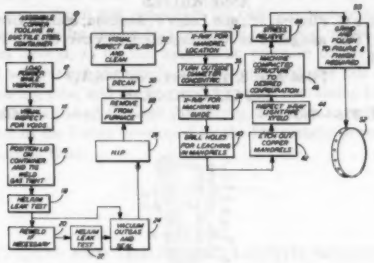
(d) special positioning each of said hexagonal shaped ele-

ments vertically by pins disposed in recesses in the bottom of each of said hexagonal shaped elements,

(e) placing said fine powder in the spaces between said elements,

(f) closing said container,

(g) hot isostatically pressing said closed container,



(h) removing said container to provide a blank including said powder and said plurality of hexagonal shaped elements,

(i) drilling holes about the periphery of said blank communicating with said hexagonal shaped elements,

(j) inserting a leaching fluid into said holes and recesses for removing all of said hexagonal shaped elements and pins.

4,492,670

PROCESS FOR MANUFACTURING SOLID CATHODES

Tiberiu Mixrah, Schaffhausen; Matthias Hoffmann, Diessenhofen; Peter Käser, and Klemens Heilig, both of Schaffhausen, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jan. 23, 1984, Ser. No. 572,798

Claims priority, application Switzerland, Feb. 10, 1983, 740/83

Int. Cl.³ C25C *7/06*; C25B *11/04*

U.S. Cl. 419—9 **14 Claims**

1. A process for manufacturing solid cathodes for the fused salt electrolytic production of aluminum wherein the cathode material is wettable by precipitated aluminum comprising:

mixing a powdered titanium and a boron containing material with a powdered carbon material where the ratio of the sum of the powdered carbon material is super stoichiometric in an amount between 5 to 20 wt.% in excess of the required stoichiometric amount with respect to said powdered titanium and a boron containing material to form titanium diboride so as to form a mixture;

heating said mixture to a first temperature of about between 2000° to 2200° C.;

holding said heated mixture at said first temperature for about 5 to 45 minutes to form a reaction product characterized by pores and channels;

heating said reaction product to a second temperature of about between 2250° to 2600° C.;

holding said heated reaction product at said second temperature for about 10 to 60 minutes to form a molten titanium diboride-carbon eutectic; and

forming a wettable cathode from said molten titanium diboride-carbon eutectic.

4,492,671

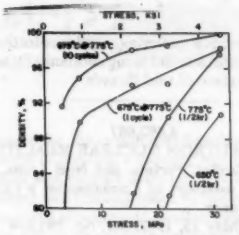
METHOD FOR CONSOLIDATION OF IRON-BASED ALLOY POWDER BY CYCLIC PHASE TRANSFORMATION UNDER PRESSURE

Oscar Ruano, Madrid, Spain; Jeffrey Wadsworth, Menlo Park, and Oleg D. Sherby, Palo Alto, both of Calif., assignors to Leland Stanford Junior University, Stanford, Calif.

Filed Mar. 15, 1982, Ser. No. 358,365

Int. Cl.³ B22F *3/16, 3/14*

U.S. Cl. 419—48 **5 Claims**



1. A powder metallurgical method of consolidating iron-based alloy powder having an alpha-gamma transformation temperature below 800° C. to form a body of high density, comprising thermally cycling the iron-based powder at least once above and below the alpha-gamma transformation temperature, and simultaneously applying a stress of from about 5 MPa to about 34.5 MPa to the powder to form a high density consolidated body.

2. The method of claim 1 in which the powder comprises an iron-carbon alloy.

3. The method of claim 2 in which the alloy comprises a white cast iron powder.

4,492,672

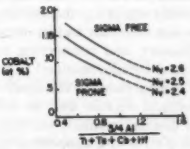
ENHANCED MICROSTRUCTURAL STABILITY OF NICKEL ALLOYS

David N. Duhl, Newington, Conn., and Xuan Nguyen-Dinh, Phoenix, Ariz., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 19, 1982, Ser. No. 369,880

Int. Cl.³ C22C *19/05*

U.S. Cl. 420—448 **1 Claim**

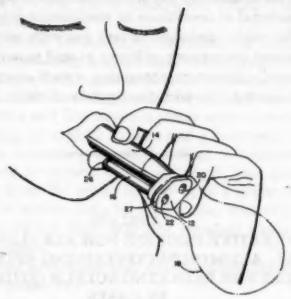


1. A method of enhancing the microstructural stability at high temperatures of nickel-base alloys having ingredients consisting essentially in weight percentage ranges set forth: chromium 12.0–24.0, tungsten 2.9 to 4.9, tantalum 3.1 to 9.9, aluminum 2.1 to 4.2, titanium 2.6 to 4.9, the improvement being characterized by the addition of cobalt within the range of 10.0 to 14.9 weight percent for bringing the electron vacancy number of the alloy within the range of 2.4 to 2.7 inclusive for reduction of precipitation of the sigma phase, the remainder being nickel.

4,492,673
DISPOSABLE SOBRIETY TESTER

Wilbur R. Eriksen, Irvine, and Harry E. Payne, Jr., Mission Viejo, both of Calif., assignors to Sobryco, Inc., El Segundo, Calif.

Filed Sep. 2, 1983, Ser. No. 528,987
Int. Cl.³ G01N 1/22, 21/78
U.S. Cl. 422—85 7 Claims



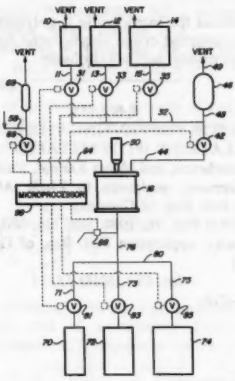
1. A disposable field sobriety tester, comprising:
(a) a base plate;
(b) inflatable balloon means having a single interior chamber and attached to said base plate in fluidtight relation thereto providing a fluid sample flowpath into and out of said balloon means;
(c) mouthpiece means having two ends and being fixedly attached at one end to said base plate in fluidtight relation thereto, said base plate having formed therein a first aperture providing a fluid path between said mouthpiece means and the interior chamber via said sample flowpath of said balloon means, and said mouthpiece means having check valve means associated therewith to prevent fluid backflow from said interior chamber of said balloon means through said mouthpiece means; and
(d) indicator means having two ends and being fixedly attached at one end to said base plate in fluidtight relation thereto, said base plate having formed therein a second aperture providing a fluid path between the interior chamber of said balloon means and said indicator means via said sample flowpath, whereby said first and second aperture communicate through said interior chamber of said balloon means; and
(e) alcohol responsive reagent means contained within said indicator means and providing a visual indication when exposed to fluid containing alcohol vapors.

4,492,674
AUTOMATED APPARATUS FOR SOLVENT SEPARATION OF A COAL LIQUEFACTION PRODUCT STREAM

Frank K. Schweighardt, Upper Macungie, Pa., assignor to International Coal Refining Company, Allentown, Pa.

Filed Jan. 17, 1983, Ser. No. 458,373
Int. Cl.³ B01D 11/00; C01G 1/00
U.S. Cl. 422—101 9 Claims

1. Apparatus for performing sequential solvent extraction of a coal liquefaction product stream containing liquids and solids dissolved or suspended therein comprising,
means containing and supplying a coal liquefaction product stream containing liquids and solids dissolved or suspended therein,
means defining and containing a supply of virgin solvent mixtures arranged in individual reservoirs,
a filter having a filter chamber and a filter element having filter pore size of from 0.5 to 10 microns,
means for delivering metered amounts of individual solvent streams from said supply reservoirs to said filter chamber under a positive pressure and additional means for maintaining said filtration chamber under a positive pressure,
valve means for controlling the flow of the individual virgin solvent streams from said supply reservoirs to the filter chamber,
means for ultrasonically agitating the contents of the filter chamber to enhance extraction by agitation,
means for receiving the solution flowing from said filter and collecting said solution in a plurality of receivers,
means for delivering the solution from the filter chamber to said receivers in individual streams,

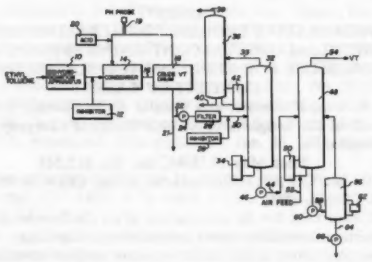


valve means situated within said means for delivering said solution from said filter to said receivers for controlling the flow of the solution passing from said filter to said receivers,
means for sensing the endpoint of solvent extraction, said sensing means determining the condition of the solution flowing from said filter to said receiver, and
control means for sequentially operating said valve means for performing sequential solvent extraction of said coal liquefaction product stream in the sample.

4,492,675
APPARATUS FOR THE PRODUCTION OF VINYLTOLUENE

James M. Watson, Big Spring, Tex., and Darrell E. Bailey, Prairieville, La., assignors to Cosden Technology, Inc., Dallas, Tex.

Division of Ser. No. 221,662, Dec. 31, 1980,. This application Oct. 29, 1981, Ser. No. 316,446
Int. Cl.³ B01D 3/34; C07C 7/05, 7/20
U.S. Cl. 422—187 14 Claims



1. An apparatus for manufacturing vinyltoluene comprising:

means for dehydrogenating ethyltoluene to form vaporous vinyltoluene;

first means for introducing a polymerization inhibitor into said vaporous vinyltoluene after said vaporous vinyltoluene leaves said dehydrogenation means;

means for condensing said vaporous vinyltoluene to produce an aqueous crude vinyltoluene feed stock, said first inhibitor introducing means is located immediately upstream of said condensing means;

means for adjusting the pH value of the aqueous phase of the condensed crude vinyltoluene feed stock to maintain said polymerization inhibitor in the organic phase of the condensed crude vinyltoluene feed stock;

means for collecting said condensed crude vinyltoluene feed stock;

a second means for introducing a polymerization inhibitor into said collected crude vinyltoluene feed stock; and

means for purifying said vinyltoluene.

4,492,676

PROCESS FOR PREVENTING THE PLUGGING OF INSTALLATIONS WITH METALLIC SULFIDES

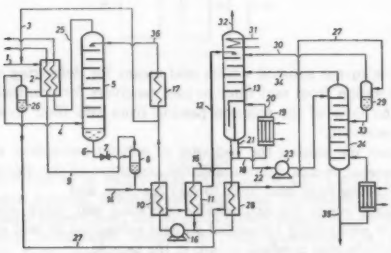
Karl Baur, Baierbrunn, and Heinz Karwat, Pullach, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Feb. 16, 1984, Ser. No. 580,598

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1983, 3308392

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—210 **20 Claims**



1. In a gas absorption process for the removal of carbon dioxide, hydrogen sulfide, and metal carbonyls from a synthesis gas, comprising scrubbing said synthesis gases with a physical solvent, regenerating resultant physical solvent and reusing resultant regenerated solvent in the scrubbing step, the improvement comprising adding to the solvent an organic phosphite or phosphine as a complexing agent for the metals in said metal carbonyls, thereby inhibiting the formation of metal sulfides which would otherwise foul parts of apparatus used in the process.

4,492,677

PREPARATIVE PROCESS FOR ALKALINE EARTH METAL, ALUMINUM-CONTAINING SPINELS AND THEIR USE FOR REDUCING THE SULFUR OXIDE CONTENT OF GASES

Jin S. Yoo, Flossmoor, and Cecelia A. Radlowski, Riverside, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed May 17, 1984, Ser. No. 611,243

Int. Cl.³ B01J *20/01, 21/00, 23/00;* **C01B** *17/96*

U.S. Cl. 423—244 **37 Claims**

1. A process for the production of an alkaline earth metal, aluminum-containing spinel composition comprising:

(a) combining (i) an acidic aqueous medium containing at least one alkaline earth metal component; (ii) at least one organic compound having inherent basicity; and (iii) a basic aqueous medium containing at least one aluminum component in which the aluminum is present as an anion to form a combined mass including a liquid phase and an alkaline earth metal, aluminum-containing precipitate, provided that the pH of said combined mass during said combining is maintained at about 8.0 or higher; and

(b) calcining said precipitate to form said alkaline earth metal, aluminum-containing spinel composition.

30. In a process for reducing the sulfur oxide content of a sulfur oxide-containing gas which includes contacting said gas with a material at conditions to associate at least a portion of said sulfur oxide contained in said gas with said material, the improvement comprising utilizing as said material an alkaline earth metal, aluminum-containing spinel composition produced in accordance with the process of claim 1.

4,492,678

PREPARATIVE PROCESS FOR ALKALINE EARTH METAL, ALUMINUM-CONTAINING SPINELS AND THEIR USE FOR REDUCING SULFUR OXIDE CONTENT IN GASES

Jin S. Yoo, Flossmoor, and Cecelia A. Radlowski, Riverside, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed May 17, 1984, Ser. No. 611,289

Int. Cl.³ B01J *20/04, 21/00, 23/00;* **C01B** *17/96*

U.S. Cl. 423—244 **39 Claims**

1. A process for the production of an alkaline earth metal, aluminum-containing spinel composition comprising:

(a) combining (i) an acidic aqueous medium containing at least one alkaline earth metal component; (ii) at least one solid organic material capable of being at least partially combusted during step (b) hereof; and (iii) a basic aqueous medium containing at least one aluminum component in which the aluminum is present as an anion to form a combined mass including a liquid phase and an alkaline earth metal, aluminum-containing precipitate, provided that the pH of said combined mass during said combining is maintained at about 8.0 or higher; and

(b) calcining said precipitate to form said alkaline earth metal, aluminum-containing spinel composition.

32. In a process for reducing the sulfur oxide content of a sulfur oxide-containing gas which includes contacting said gas with a material at conditions to associate at least a portion of said sulfur oxide contained in said gas with said material, the improvement comprising utilizing as said material an alkaline earth metal, aluminum-containing spinel composition produced in accordance with the process of claim 1.

4,492,679

CYANURIC CHLORIDE HAVING IMPROVED SHELF LIFE

Horst Michaud, Trostberg, and Joachim von Seyerl, Seeon, both of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Jul. 22, 1983, Ser. No. 516,260

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1982, 3228915

Int. Cl.³ C01C *3/08*

U.S. Cl. 423—268 **9 Claims**

1. Cyanuric chloride having improved shelf life, comprising cyanuric chloride and 0.1–10 percent by weight of dicyandiamide.

4,492,680

REMOVAL OF CADMIUM FROM ACIDIC PHOSPHATIC SOLUTIONS

Klaus Frankenfeld; Peter Ruschke, both of Budenheim; Peter Brodt, Idstein-Eschenhahn, and Gerhard Eich, Ingelheim, all of Fed. Rep. of Germany, assignors to Chemische Fabrik Budenheim, Budenheim, Fed. Rep. of Germany

Filed May 18, 1983, Ser. No. 495,653

Claims priority, application Fed. Rep. of Germany, May 18, 1982, 32185995

Int. Cl.³ C01B *25/16;* B03C *1/00;* C01G *9/00*

U.S. Cl. 423—321 S 20 Claims

1. A process for the selective extraction of cadmium ion from a P_2O_5-containing acid solution comprising the steps of:

(a) providing a first aqueous phase comprising an aqueous acid solution containing an amount of cadmium ion;

(b) contacting said first aqueous phase with an organic phase comprising an organic solvent and a hydrogen halide salt of amine containing an alkyl radical of between about 8 and about 30 carbon atoms in length, said amine being selected from the group consisting of a primary amine, a secondary amine, and a tertiary amine, whereby cadmium ion is extracted from said first aqueous phase into said organic phase;

(c) thereafter separating said organic phase from said first aqueous phase; and

(d) contacting said organic phase with a second aqueous phase comprising one selected from the group consisting of a saline solution and water to extract cadmium ion from said organic phase into said second aqueous phase.

4,492,681

METHOD FOR THE PREPARATION OF SILICON CARBIDE FIBERS

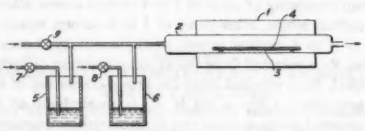
Morinobu Endou, Nagano; Minoru Takamizawa, Tokyo; Tatsuhiko Hongu, Kanagawa, and Taishi Kobayashi, Niigata, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 17, 1983, Ser. No. 505,250

Claims priority, application Japan, Jun. 30, 1982, 57-113689

Int. Cl.³ C01B *31/36*

U.S. Cl. 423—345 11 Claims



1. A method for the preparation of silicon carbide fibers by the pyrolysis of an organosilicon compound on a substrate at an elevated temperature which comprises contacting a feed gas containing an organosilicon compound having at least one hydrogen atom and no halogen and oxygen atoms directly bonded to the silicon atoms at an elevated temperature with a finely divided powder of a metal or a compound of the metal to effect pyrolysis of the organosilicon compound.

4,492,682

PREPARATION OF ULTRAPURE BOEHMITES AND/OR PSEUDO-BOEHMITES

Emile Trebillon, Neuilly/sur/Seine, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Jan. 25, 1983, Ser. No. 460,926

Claims priority, application France, Jan. 29, 1982, 82 01391

Int. Cl.³ C01F *7/02*

U.S. Cl. 423—626 20 Claims

1. A process for the preparation of ultrapure and homogeneous boehmite and pseudo-boehmite, comprising (i) admixing amorphous aluminum hydroxycarbonate which has been prepared by carbonating an alkali metal aluminate with carbon dioxide and then filtering and washing the precipitate which results, with a solution of an acid, a base, a salt, or mixture thereof, with the pH of the reaction medium which results being maintained at a value of less than 11, (ii) next heating such reaction medium at a temperature of less than 90° C. for a period of at least 5 minutes, and (iii) thence heating the reacting medium resulting from the step (ii) at a temperature ranging from 90° C. to 250° C.

4,492,683

METHOD FOR INHIBITING THE GROWTH OF FUNGI WITH PHENYL GLYCINE COMPOUNDS

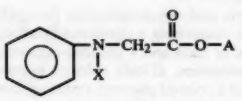
Krishen L. Nagpal, Williamsville, N.Y., assignor to Buffalo Color Corporation, West Paterson, N.J.

Filed Aug. 6, 1982, Ser. No. 406,007

Int. Cl.³ A01N *37/10, 37/12*

U.S. Cl. 424—309 6 Claims

1. A method of inhibiting the growth of fungi which comprises contacting the fungi with a fungicidal amount of at least one compound of the formula



wherein A is hydrogen, or an alkyl group having from 2 to 10 carbon atoms, and X is selected from hydrogen or $C{=}ZNHCH_3$ wherein Z is oxygen or sulfur.

4,492,684

SLOW RELEASE INJECTABLE INSULIN COMPOSITION

Mattheus F. A. Goosen, Toronto, and Anthony M. F. Sun, Willowdale, both of Canada, assignors to Connaught Laboratories Limited, Willowdale, Canada

Filed Jun. 20, 1983, Ser. No. 505,840

Claims priority, application Canada, Jun. 8, 1983, 429960

Int. Cl.³ A61K *9/22, 9/26, 37/26*

U.S. Cl. 424—19 9 Claims

1. A biodegradable insulin-containing composition suitable for administration to a living body for the control of blood sugar levels therein, comprising a matrix of partially cross-linked physically-native albumin and insulin where the extent of said partial cross-linking is such as to permit insulin to be released from the matrix by diffusion and/or erosion when positioned in the body, said cross-linking being achieved by the use of glutaraldehyde in a concentration of less than 3.75% v/w of the albumin.

4,492,685

PROTECTIVE SKIN MATRIX

Alec D. Keith, Miami, Fla., and Wallace Snipes, State College, Pa., assignors to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation of Ser. No. 425,853, Sep. 28, 1982, abandoned, which is a continuation of Ser. No. 295,689, Aug. 24, 1981, abandoned, which is a continuation of Ser. No. 163,105, Jun. 26, 1980, abandoned, which is a continuation of Ser. No. 109,242, Jan. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 2,565, Jan. 11, 1979, abandoned, and Ser. No. 47,084, Jun. 11, 1979, abandoned. This application Jan. 30, 1984, Ser. No. 574,844

Claims priority, application Japan, Aug. 14, 1979, 54-103459

Int. Cl.³ A61K *9/70;* A61L *15/03;* A61F *13/00*

U.S. Cl. 424—28 9 Claims

1. A cured self-supporting polymeric diffusion matrix suitable for providing protection to a burned or wounded patient, said matrix being formed by:

(a) heating an aqueous system comprising 2 to 20% glycerol,

4 to 30% polyvinyl alcohol molecular weight 50,000 to 150,000, 2 to 20% polyvinylpyrrolidone molecular weight 25,000 to 100,000, and the balance water, the weight ratio of polyvinyl alcohol to polyvinylpyrrolidone being 2:1 to 3:2, the weight ratio of glycerol to polyvinyl alcohol and polyvinylpyrrolidone together being 0.5:1 to 1:1, and weight ratio of water to glycerol being 3:1 to 7:1, until solution occurs,

(b) casting or molding the resultant solution, and

(c) curing the cast or molded solution by permitting it to stand for one-half to twenty-four hours.

4,492,686

COSMETIC MAKEUP CONTAINING COLORED PIGMENTS SALIFIED WITH AMINE FUNCTIONS

Michel Guillon, Bourg-la-Reine; Jean Mondet, Sevran; Christos Papantoniou, Montmorency, and Claudine Vandenbossche, Aulnay-sous-Bois, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Oct. 13, 1982, Ser. No. 433,874

Claims priority, application France, Oct. 15, 1981, 81 19388

Int. Cl.³ A61K *7/04, 7/021, 31/00, 47/00*

U.S. Cl. 424—61 **7 Claims**

1. In a cosmetic makeup composition for application to the lips, skin or nails comprising a cosmetically acceptable vehicle for the lips, skin or nails and a colored pigment, wherein the improvement comprises, as said colored pigment, 0.1 to 20 weight percent of a colored pigment resulting from the salification reaction in an aqueous medium of an azo dye selected from the group consisting of D and C Red 7, D and C Red 8, D and C Red 33, D and C Yellow 5, D and C Yellow 6, D and C Red 2 and D and C Red 4, with polyvinylamine hydrochloride, said colored pigment having a molecular weight between 1,000 and 200,000, said dye being attached to polyvinylamine hydrochloride by said salification reaction in an amount of at least 10 weight percent of the stoichiometric quantity.

4,492,687

LIGHT-STABLE PESTICIDAL COMPOSITIONS

Jean-Jacques Hervé, Aubagne; Jean-Claude Suglia, Le Destrousse, and Colette Meinard, Marseille, all of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 271,989, Jun. 9, 1981, Pat. No. 4,440,756. This application Nov. 8, 1983, Ser. No. 550,082

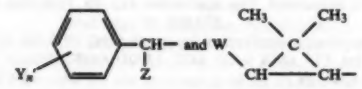
Claims priority, application France, Jun. 11, 1980, 80 12960; Jan. 16, 1981, 81-00752

Int. Cl.³ A01N *25/22*

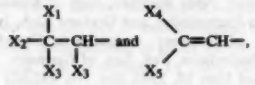
U.S. Cl. 424—174 **29 Claims**

1. A light stable pyrethrinoid composition comprising (a) at least one liquid vehicle, (b) at least one surface-active agent soluble in the said liquid vehicle, (c) 0.1 to 10 gl/l of at least one azodyestuff stabilizer selected from the group consisting of N-ethyl-1-[{4-(phenylazo)-phenyl}-azo]-2-naphthalenylamine (Red to fat 7B), 1-[{1-naphthalenyl}-azo]-2,4-benzene-diamine (Brown RR to fat) and N,N-diethyl-4-(phenyl azo)-benzeneamine (Yellow to fat GGN), and (d) 5 to 100 g/l of at least one ester of the formula

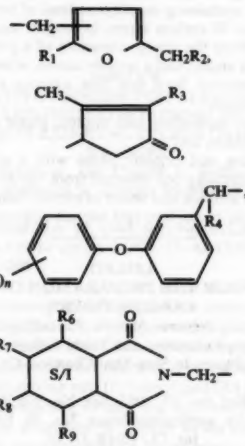
wherein Y is selected from the group consisting of



in its various stereoisomeric forms and mixtures thereof, Z is alkyl of 1 to 6 carbon atoms, Y' is selected from the group consisting of hydrogen, halogen, —CN, —NO_3, alkyl of 1 to 4 carbon atoms and alkoxy of 1 to 4 carbon atoms, n is 0,1,2 or 3, W is selected from the group consisting of



X_1 and X_2 are individually selected from the group consisting of fluorine, chlorine and bromine, X_3 is selected from the group consisting of chlorine, bromine and iodine, X_4 is a halogen and X_5 is a halogen other than that of X_4 and due to asymmetric carbon atom in W, the compounds are in the A isomer or B isomer form or mixtures thereof and R is selected from the group consisting of



and benzyl optionally substituted with at least one member of the group consisting of alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkenyloxy of 2 to 6 carbon atoms, alkadienyl of 4 to 8 carbon atoms, methylenedioxy, benzyl and halogens, R_1 is selected from the group consisting of hydrogen and methyl, R_2 is selected from the group consisting of monocyclic aryl and —CH_2—C≡CH, R_3 is an aliphatic of 2 to 6 carbon atoms having at least one carbon-carbon unsaturation, R_4 is selected from the group consisting of H, —CN, —CH_3 and —C≡CH, R_5 is selected from the group consisting of chlorine and methyl, n is 0, 1 or 2, R_6, R_7, R_8 and R_9 are individually selected from the group consisting of hydrogen, chlorine and methyl and S/I indicates that the ring may be aromatic, dihydro or tetrahydro, the alcoholic moiety R-OH being capable of containing one or more asymetric carbon atoms and of existing in the form of various stereoisomers.

4,492,688

ANTIBACTERIAL CYCLIC ETHERS OF 9-DEOXO-9A-AZA-9A-HOMOERYTHROMYCIN A AND INTERMEDIATES THEREFOR

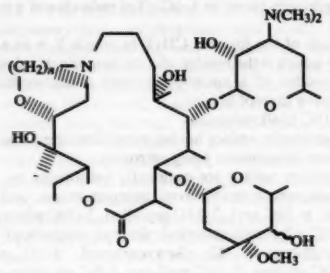
Gene M. Bright, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 497,773, May 23, 1983, abandoned. This application Nov. 25, 1983, Ser. No. 555,221

Int. Cl.³ A61K *31/71;* **C07H** *17/08*

U.S. Cl. 424—180 **29 Claims**

1. A compound having the formula



(I)

and the pharmaceutically acceptable acid addition salts thereof wherein n is 1, 2 or 3; the wavy line at the 4"—OH group represents the axial and equatorial configurations at said position; provided that when n is 1, the 4"—OH group has the equatorial configuration.

26. A method for treating a bacterial infection in a mammal which comprises administering to said mammal an antibacterially effective amount of a compound of claim 1.

4,492,689

HALOGENATED 1-HYDROXYPYRAZOLES AND THEIR USE AS PESTICIDES

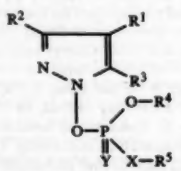
Norbert Rieber, Mannheim; Heinrich Böehm, Neuhofen, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 9, 1983, Ser. No. 465,269

Int. Cl.³ A01N 57/16; C07F 9/65

U.S. Cl. 424—200 13 Claims

1. A 1-pyrazolyl-phosphoric acid ester of the formula



(II)

where R^1, R^2 and R^3 independently of one another are hydrogen, chlorine, bromine or iodine, with the proviso that R^1, R^2 and R^3 are not all hydrogen, R^4 and R^5 are identical or different and each is alkyl of 1 to 6 carbon atoms, and X and Y are oxygen or sulfur.

6. A compound of the formula II as defined in claim 1, wherein R^1, R^2 and R^3 are each chloro.

4,492,690

PHOSPHORIC AND THIOPHOSPHORIC ESTERS OF 5(3)-HYDROXYPYRAZOLES EXERTING AN INSECTICIDAL ACTION

Pier M. Boschi, Piacenza; Franco Gozzo, S. Donato Milanese, and Angelo Longoni, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 426,881, Sep. 29, 1982, Pat. No. 4,459,294, which is a continuation of Ser. No. 182,680, Aug. 29, 1980, abandoned, which is a continuation of Ser. No. 129,724, Mar. 12, 1980, Pat. No. 4,256,902, which is a continuation-in-part of Ser. No. 971,548, Dec. 20, 1978, abandoned. This application Aug. 18, 1983, Ser. No. 524,229

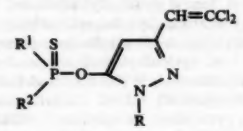
Claims priority, application Italy, Dec. 23, 1977, 31190 A/77; Dec. 23, 1977, 31191 A/77

The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.

Int. Cl.³ A01N 57/16; C07D 9/65

U.S. Cl. 424—200 7 Claims

1. A thiophosphoric ester of a 5-hydroxypyrazole, having the formula



wherein:

R=H, alkyl with from 1 to 7 carbon atoms, optionally substituted with the CN group, or phenyl; and

R^1 and R^2, equal to or different from each other, =O-alkyl.

7. A composition for fighting infestations of insects, acari and nematoda, characterized in that such compositions contain as active ingredient a compound as defined in claim 1, in quantities ranging from 0.1% upwards by weight together with an inert carrier.

4,492,691

AZATETRACYCLIC CARBONITRILES

Hans Blattner, Riehen, and Angelo Storni, Rheinfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

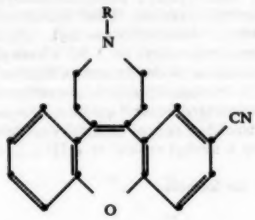
Continuation of Ser. No. 212,472, Dec. 3, 1980, abandoned. This application Jul. 1, 1982, Ser. No. 394,368

Claims priority, application Switzerland, Dec. 10, 1979, 10928/79

Int. Cl.³ C07C 491/02; A61K 31/55

U.S. Cl. 424—244 9 Claims

1. A compound of the formula I



(I)

wherein R represents lower alkyl having from 1 to 4 carbon atoms or cyclopentylmethyl and pharmaceutically acceptable salts thereof.

7. A method of treatment of agitated states in a warm-blooded animal, which comprises administering to said animal a therapeutically effective amount of a compound according to claim 1, or a pharmaceutically acceptable salt of such a compound.

4,492,692

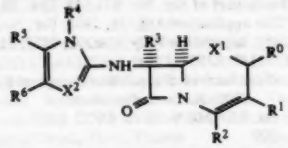
CEPHALOSPORIN DERIVATIVES

Frederic H. Jung, Rilly la Montagne, France, and Gareth M. Davies, Cheshire, England, assignors to Imperial Chemical Industries PLC, London, England and ICI Pharma, Enghien-les-Bains, France

Filed Dec. 22, 1981, Ser. No. 333,570
Claims priority, application France, Dec. 22, 1980, 80 27254
Int. Cl.³ A61K 31/545; C07D 501/56
U.S. Cl. 424—246 9 Claims

1. A cephalosporin derivative of the formula:

(I)

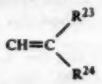


in which R^0 is a hydrogen atom; R^1 is a hydrogen or halogen atom, a hydroxy or amino radical or a radical selected from:

(a) 1–6C alkyl, benzyl optionally substituted by fluorine or methoxy, 1–6C haloalkyl, formyl, carboxy, 1–6C alkoxy, 1–6C methylthio, 1–6C alkylamino, phenylamino, benzylamino, 3–6C cycloalkylamino, cyano, 2–6C alkoxycarbonyl, 2–6C alkanoyl, 3–10C alkoxycarbonylalkyl, 2–6C alkoxycarbonylamino, 2–6C alkylthiocarbonylamino, piperidino, pyrrolidino, morpholino, 2–6C alkanoylamino, ureido, 2–6C alkylureido, 3–8C dialkylureido, 1–6C alkanesulphinyl, 1–6C alkanesulphonyl, heterocyclyl and heterocyclylthio radicals in which the heterocycle is a 1,3,4-thiadiazol-2-yl or 1,3,4-oxadiazol-2-yl, each optionally substituted in the 5-position, a 1H-tetrazol-5-yl optionally substituted in the 1-position, or a 1H-1,2,3-triazol-4-yl radical optionally substituted in the 1 or 5 position, the optional substituents in each of these heterocycles being a 1–6C alkyl, a 1–6C sulphoalkyl, a 2–6C carboxyalkyl, a 1–6C haloalkyl or a 3–6C alkylthioalkyl radical or a pyridazin-3-yl, oxazol-3-yl or thiazol-3-yl each optionally substituted by 1 or 2 radicals selected from 1–6C alkyl, 1–6C haloalkyl and 2–6C alkoxycarbonyl radicals;

(b) radicals of the formula:

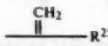
(XIII)



in which R^{23} and R^{24}, which may be the same or different, are hydrogen atoms, 1–6C alkyl, 5–7C cycloaliphatic, 6–12C aryl, 7–10C arylalkyl, formyl, cyano, carboxy, 2–6C alkoxycarbonyl, sulpho, 1–6C alkanesulphinyl, 1–6C alkanesulphonyl, 1–6C alkoxy, 1–6C alkylthio, carbamoyl, nitro, 1–6C hydroxyalkyl, methylcarbamoyloxymethyl, benzylcarbamoyloxymethyl, 2–6C alkoxymethyl, 2–6C alkylthiomethyl, 2-haloethoxymethyl, cyclopentyloxymethyl, benzyloxymethyl or 3–8C alkanoyloxymethyl radicals or radicals of the formula CH_2SHet^1 in which Het^1 is a 1,3,4-thiadiazol-2-yl or 1,3,4-oxadiazol-2-yl, both optionally substituted in the 5-position by a methyl radical, a 1H-triazol-5-yl radical optionally substituted in the 1-position by a methyl radical or a 1H-1,2,3-triazol-4-yl radical;

(c) radicals of the formula:

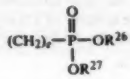
(XIV)



in which R^{25} is a cyano, carboxy or 2–6C alkoxycarbonyl radical;

(d) radicals of the formula:

(XV)



in which R^{26} and R^{27}, which may be the same or different, are hydrogen atoms or 1–6C alkyl radicals and e is 1 to 4; and

(e) radicals of the formula CH_2Y in which Y is an atom or group which is the residue of a nucleophile or a derivative of a residue of a nucleophile, such a nucleophile or a derivative thereof being:

A. 3–15C trialkylamines;

B. heterocyclic amines having more than one heteroatom, at least heteroatom being nitrogen;

C. pyridines which are optionally substituted by 1 to 3 substituents selected from halogen atoms, and 1–6C alkyl, 6–10C aryl, 7–11C arylalkyl, 2–10C alkoxyalkyl, 3–10C alkanoyloxymethyl, formyl, carbamoyl, 2–6C alkanoyloxy, 2–6C alkoxycarbonyl, 1–6C alkoxy, 6–10C aryloxy, 7–11C aralkoxy, 1–6C alkylthio, 6–10C arylthio, 7–11C aralkylthio, cyano, hydroxy, 2–6C alkylcarbamoyl, 3–10C dialkylcarbamoyl, 2–6C (hydroxyalkyl)carbamoyl and 2–6C carbamoylalkyl radicals;

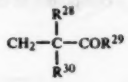
D. azide radicals;

E. amino, 1–6C alkanoylamino and 7–11C aroylamino radicals;

F. cyanide, pyrroles and substituted pyrroles;

G. nucleophiles giving rise to R^1 of the formula:

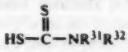
(XVI)



in which R^{28} and R^{29}, which may be the same or different, are selected from hydrogen atoms and cyano, 1–6C alkyl, 2–6C alkoxycarbonyl, 8–20C mono- or di-arylalkoxycarbonyl, 2–6C alkanoyl, 7–11C aralkyl, cyclopentyl and cyclohexyl radicals, and phenyl radicals optionally substituted by 1 or 2 radicals selected from halogen atoms and 1–6C alkyl, 1–6C alkoxy, 1–6C alkylamino, nitro and amino radicals, and R^{30} is selected from hydrogen, 1–6C alkyl, 7–11C aralkyl, cyclopentyl and cyclohexyl radicals, and phenyl radicals optionally substituted by 1 or 2 radicals selected from halogen atoms, 1–6C alkyl, 1–6C alkoxy and 1–6C alkylamino radicals;

H. thiourea optionally substituted by a 1–6C alkyl, 6–10C aryl, 5–7C alicyclic or a heterocyclic radical, dithiocarbamates, thioamides substituted by a 1–6C alkyl or 6–10C aryl radical or thiosemicarbazides, thiosulphates, arylthioacids or heterocyclicthioacids of up to 10 carbon atoms and dithioacids of the formula:

(XVII)



in which R^{31} and R^{32} which may be the same or different, are hydrogen atoms, 1–6C alkyl, 2–6C hydroxyalkyl, 3–8C alkylaminoalkyl, 4–10C dialkylaminoalkyl or phenyl radicals, or R^{31} and R^{32} are joined to form a pyrrolidine, piperidine or morpholine ring or a piperazine ring which is optionally substituted on the nitrogen atom by one or two (in quarternised form) radicals selected from 1–6C alkyl and 3–6C alkenyl radicals;

I. radicals of the formula $R^{33}S(O)d$— in which d is 0, 1 or 2 and R^{33} is a 1–6C alkyl, 5–7C alicyclic, 6–10C aryl optionally substituted by a carboxy radical, or 7–11C arylalkyl radical or a 5- or 6-membered heterocyclic ring (partially or fully unsaturated) containing 1 to 4 nitrogen atoms which ring may further include oxygen and/or sulphur atoms, in which the nitrogen atom or atoms may be in the oxide form, which herterocyclic ring may be fused with another heterocyclic ring within the same definition or may be fused with a benzene ring, the above aryl, arylalkyl, heterocyclic or fused benzene ring being optionally substituted by 1 or 2 substituents selected from halogen atoms and 1–6C alkyl, 1–6C haloalkyl, 6–10C aryl, 2–6C alkenyl, 1–6C alkoxy, oxo, hydroxy, mercapto, amino, carboxy, cyano, isothi-

ocyanato, carbamoyl, sulphamoyl, 2–6C alkoxycarbonyl, 3–6C alkenyloxycarbonyl, 8–12C aralkylcarbonyl, 7–11C aryloxycarbonyl, 2–6C hydroxyalkyl, 3–6C dihydroxyalkyl, sulphoamino and 1–6C alkanesulphonylamino radicals and radicals of the formula B—R^{34} in which B is a 2–8C straight or branched chain which may be interrupted by a sulphur or oxygen atom or by an NH or 1–6C N-alkyl radical and R^{34} is a radical selected from hydroxy, mercapto, cyano, 1–6C alkylamino, 2–6C dialkylamino, 2–6C alkanoylamino, carboxy, sulpho, carbamoyl, sulphamoyl, amidino, quinidino, 2–6C alkoxycarbonyl, 2–6C alkylcarbamoyl, 2–6C dialkylcarbamoyl, 1–6C alkylsulphamoyl, 2–6C dialkylsulphamoyl, sulphoamino, ureido, 1–6C alkoxy, 1–6C alkylthio, 1–6C alkanesulphonyl, 2–6C alkanoyl and 2–6C alkanoyloxy radicals and radicals of the formula —S—R^{35} in which R^{35} is a 1–6C alkyl radical or a group of the formula B—R^{34} in which B and R^{34} have the meanings given above and radicals of the formula $NR^{36}R^{37}$ in which R^{36} and R^{37}, which may be the same or different, are selected from 1–6C alkyl radicals, groups of the formula B-R^{34} in which B and R^{34} have the definitions given above, 1–6C alkoxycarbonyl, 2–6C alkanoyl, carbamoyl, 2–6C alkylcarbamoyl and 3–10C dialkylcarbamoyl radicals;

J. radicals of the formula R^{38}—O— in which R^{38} is a hydrogen atom, or a 1–6C alkyl, 3–6C alkenyl, 3–6C alkynyl, 5–7C cycloalkyl, 6–12C cycloalkylalkyl, 6–10C aryl, 7–11C arylalkyl or furfuryl radical, any of which may be substituted by 1 or 2 radicals selected from halogen atoms, and 1–6C alkyl, nitro, hydroxy, carboxy, 2–6C alkanoyloxy, 2–6C alkoxycarbonyl, 2–6C alkanoyl, 1–6C alkanesulphonyl, 1–6C alkoxysulphonyl, amino, 1–6 alkylamino and 2–6C alkanoylamino radicals or R^{38} is a carbamoyl radical;

K. radicals of the formula R^{39}—Q—COO— in which Q is a direct bond, an oxygen or sulphur atom or an NH radical and R^{39} is:

(i) a hydrogen atom or a 1–6C alkyl radical which may be interrupted by an oxygen or sulphur atom or by an NH group or substituted by a cyano, carboxy, methoxycarbonyl, ethoxycarbonyl, hydroxy, carboxycarbonyl, halogen or amino radical;

(ii) a 2–6C alkenyl radical which may be interrupted by an oxygen or sulphur atom or an NH group;

(iii) a phenyl, hydroxyphenyl, chlorophenyl, fluorophenyl, tolyl, nitrophenyl, aminophenyl, methoxyphenyl, methylthiophenyl, thienyl, pyridyl, cyclohexyl, cyclopentyl, sydnonyl, naphthyl or ethoxynaphthyl radical;

or (iv) R^{40}-$(CH_2)_g$ where R^{40} has the value for R^{39} listed in (i) above and g is 1 to 4;

R^2 is a carboxy radical;

R^3 is a hydrogen atom;

X^1 is a sulphur or oxygen atom;

X^2 is a nitrogen atom;

R^4 is hydrogen;

R^6 is hydrogen and R^5 is a 2–6C alkenyl, 2–10C alkanesulphonylaminoalkyl, 2–6C cyanoalkyl, 1–6C nitroalkyl, 2–6C alkanoylaminoalkyl, 3–8C haloalkanoylaminoalkyl, 3–8C alkylcarbamoyloxyalkyl, 2–6C ureidoalkyl, 3–15C heterocyclylcarbonylaminoalkyl or 4–15C heterocyclylalkylcarbonylaminoalkyl radical wherein the heterocyclic radical is a 5- or 6-membered aromatic or non-aromatic heterocyclic radical which contains 1, 2, 3 or 4 hetero atoms selected from oxygen, nitrogen and sulphur atoms, such ring optionally being in the form of the N-oxide and such ring being optionally fused with a benzene ring, and such fused benzene and/or heterocyclic ring being optionally substituted by one or two substituents selected from halogen atoms and 1–6C alkyl, hydroxy, 1–6C alkoxy, phenoxy, mercapto, 1–6C alkylthio, phenylthio, carboxy, 2–6C alkoxycarbonyl, phenoxycarbonyl, carbamoyl, 2–6C alkylcarbamoyl, 3–10C dialkylcarbamoyl, phenylcarbamoyl, diphenylcarbamoyl, nitro, amino, 1–6C alkylamino, 2–8C dialkylamino, phenylamino, 7–12C (phenyl(alkyl)amino, diphenylamino, carboxyamino, 2–6C (carboxy)(alkyl)amino, (carboxy)(phenyl)amino, 1–6C alkanoylamino, 2–10C (alkanoyl)(alkyl)amino, benzoylamino, 8–14C (benzoyl)-(alkyl)amino, cyano, phenyl, sulphamoyl, 1–6C alkylsulphamoyl, 2–10C dialkylsulphamoyl, phenylsulphamoyl, 1–6C haloalkyl, 1–6C aminoalkyl, 2–8C alkylaminoalkyl, 3–12C dialkylaminoalkyl, 2–6C carboxyalkyl and 1–6C sulphoalkyl radicals or R^5 is a radical of the formula:

$$R^9—S—(CH_2)_m \quad (II)$$
$$\quad\quad\quad\quad\quad\quad (O)_n$$

in which m is 1 to 6, n is 1 or 2 and R^9 is a 1–6C alkyl radical;

and, where the compound of the formula I contains a free basic or acidic group, the pharmaceutically-acceptable acid- or base-addition salts thereof.

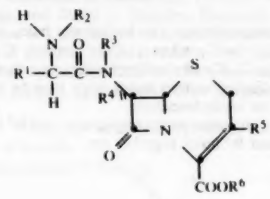
4,492,693

BENZOTHIENYLGLYCYL CEPHALOSPORIN DERIVATIVES

Larry C. Blaszczak, Indianapolis; Stjepan Kukolja, and Jan R. Turner, both of Carmel, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

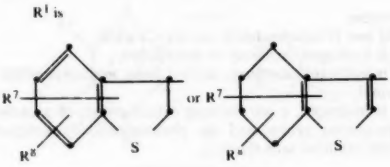
Filed Apr. 12, 1983, Ser. No. 484,129
Int. Cl.[3] A61K *31/545*; C07D *501/22*
U.S. Cl. 424—246 **40 Claims**

1. A compound of the formula



wherein

R^1 is



in which

R^7 and R^8 independently are hydrogen, halo, hydroxy, C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro, amino, C_1–C_4 alkanoylamino, C_1–C_4 alkylsulfonylamino, and when R^7 and R^8 are on adjacent carbon atoms, they can be taken together to form methylenedioxy;

R^2 is hydrogen, an amino protecting group, and R^3 is hydrogen, or R^2 and R^3 taken together are

where M and N independently are C_1–C_4 alkyl;

R^4 is hydrogen, methoxy or methylthio;

R^5 is hydrogen, methoxy, methyl, halo, methoxymethyl, or vinyl;

R^6 is hydrogen, a salt forming cation group, or a carboxy protecting group; and the pharmaceutically acceptable acid addition salts thereof.

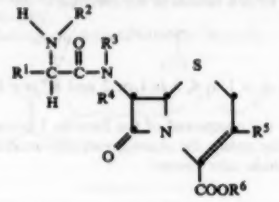
4,492,694

INDOLYLGLYCYL CEPHALOSPORIN DERIVATIVES

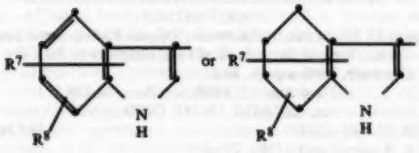
Larry C. Blaszczak, Indianapolis, and Jan R. Turner, Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 12, 1983, Ser. No. 484,340
Int. Cl.³ A61K 31/545; C07D 501/22
U.S. Cl. 424—246 40 Claims

1. A compound of the formula



wherein: R^1 is



in which

R^7 and R^8 independently are hydrogen, halo, hydroxy, C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro, amino, C_1–C_4 alkanoylamino, C_1–C_4 alkylsulfonylamino, or when R^7 and R^8 are on adjacent carbon atoms, they may be taken together to form methylenedioxy;

R^2 is hydrogen, an amino protecting group, and R^3 is hydrogen, or R^2 and R^3 taken together are

where

M and N independently are C_1–C_4 alkyl;

R^4 is hydrogen, methoxy or methylthio;

R^5 is hydrogen, methoxy, methyl, halo, methoxymethyl, or vinyl;

R^6 is hydrogen, a salt forming cation group, or a carboxy protecting group; and the pharmaceutically acceptable acid addition salts thereof.

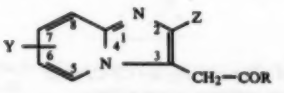
4,492,695

THERAPEUTICALLY USEFUL IMIDAZO[1,2-A]PYRIDINE DERIVATIVES

Jean-Pierre Kaplan, Bourg la Reine; Pascal George, Vitry, and Jean-Michel Bernardon, Chilly Mazarin, all of France, assignors to Synthelabo, Paris, France

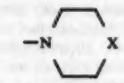
Filed Apr. 13, 1983, Ser. No. 484,611
Claims priority, application France, Apr. 21, 1982, 82 06841
Int. Cl.³ A61K 31/435; C07D 471/04
U.S. Cl. 424—246 12 Claims

1. An imidazo[1,2-a]pyridine derivative of the formula:



(I)

wherein Y represents a hydrogen or halogen atom or a C_1–C_4 alkyl radical, Z represents a furan-2-yl, thien-2-yl or pyridin-2-yl radical optionally carrying a halogen atom or a methyl or ethyl radical in the 5-position, and R represents the hydroxy radical, a C_1–C_4 alkoxy radical or a group $-NR_1R_2$ in which R_1 and R_2 independently of one another each represent a hydrogen atom; a straight- or branched-chain C_1–C_5 alkyl radical optionally carrying one or more halogen atoms or a hydroxy radical, a group $-N(C_1$–C_4 alkyl$)_2$, a carbamoyl radical or a C_1–C_4 alkoxy radical; the allyl radical; the propargyl radical; a C_3–C_6 cycloalkyl radical; the benzyl radical; or the phenyl radical, or alternatively-NR_1R_2 together represent a heterocyclic ring containing from 3 to 6 carbon atoms, or a heterocyclic ring of the formula



in which X is 0, S, CHOR' or N-R", R' being a hydrogen atom or the benzyl radical and R" being a hydrogen atom, a C_1–C_4 alkyl radical or the phenyl radical optionally carrying a methoxy radical or a halogen atom, and pharmaceutically-acceptable acid addition salts thereof.

12. A method for the treatment of anxiety states, sleep disorders, and behavioural disorders attributable to cerebral vascular damage and to the cerebral sclerosis encountered in geriatrics, which comprises administering to a patient with such an ailment an amount of an imidazo[1,2-a]-pyridine derivative of the formula depicted in claim 1, wherein Y, Z and R are defined in claim 1, or a pharmaceutically-acceptable acid addition salt thereof, sufficient to ameliorate the condition of the patient.

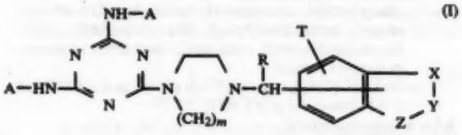
4,492,696

PIPERAZINE AND HOMOPIPERAZINE COMPOUNDS

Gilbert Regnier, Chatenay-Malabry; Michel Laubie, Vaucresson, and Jacques Duhault, Croissy sur Seine, all of France, assignors to ADIR, Neuilly-sur-Seine, France

Filed Feb. 15, 1983, Ser. No. 466,603
Claims priority, application France, Feb. 17, 1982, 82 02555
Int. Cl.³ A61K 31/53; C07D 403/14, 409/14, 405/14
U.S. Cl. 424—249 4 Claims

1. A compound selected from the group consisting of: piperazine and homopiperazine compounds of the formula:



(I)

in which:

A is selected from the group consisting of hydrocarbon radicals having from 3 to 5 carbon atoms inclusive, in straight and branched chain and these radicals containing one and two double bonds and substituted by one and two hydroxy;

m is an integer selected from 2 and 3;

—X—Y — represents a group of the formula:

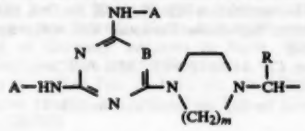
$-CH{=}CH-(CR'R")_n-$ in which n is selected from the group consisting of 0 and 1, and R' and R" which are the same or different are each selected from the group consisting of hydrogen and methyl;

Z is selected from the group consisting of oxygen and sulfur;

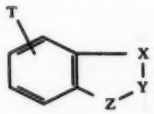
R is selected from the group consisting of hydrogen, alkyl having from 1 to 5 carbon atoms inclusive, cycloalkyl having from 3 to 7 carbon atoms inclusive, unsubstituted phenyl and phenyl mono- and poly-substituted by a substituent selected from the group consisting of fluorine, chlorine and alkyl having from 1 to 5 carbon atoms inclusive;

T is selected from the group consisting of hydrogen, fluorine,

chlorine and alkyl having from 1 to 5 carbon atoms inclusive,
and the group



is bonded to either one of the cycles forming the group:



in the formula I; and
physiologically tolerable addition salts thereof.

3. A pharmaceutical composition, suitable for use in the treatment of hypoxia, containing as active ingredient a compound of claim 1, in an amount effective for such purpose, together with a suitable pharmaceutical carrier.

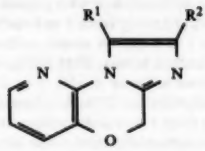
4,492,697

4H-IMIDAZO[2,3-C]PYRIDO[2,3-E][1,4]OXAZINE DERIVATIVES

Jean A. Gauthier, and Ivo L. Jirkovsky, both of Montreal, Canada, assignors to Ayerst, McKenna & Harrison, Inc., Montreal, Canada

Filed Aug. 16, 1983, Ser. No. 523,989
Int. Cl.³ A61K *31/535*; C07D *498/14*
U.S. Cl. 424—248.4 **7 Claims**

1. A compound of the formula



in which R^1 and R^2 are hydrogen, or R^1 is amino and R^2 is COR^3 wherein R^3 is lower alkoxy, lower alkylamino, di(lower alkyl)amino, 1-pyrrolidinyl or 1-piperidinyl, or a therapeutically acceptable acid addition salt thereof.

6. A method of preventing or treating anaphylactic reactions or allergic conditions in a mammal, which comprises administering to said mammal an effective anaphylaxis alleviating or allergy alleviating amount of a compound of claim 1.

4,492,698

DIPHENYLBUTYL-1-ACYLPIPERAZINES

Anders K. Björk, Svalvägen 9; Aina L. Abramo, Järavallsgatan 30, both of S-230 50 Bjärred, and Erik G. Christensson, Nils Bjelkegatan 3 A, S-222 20 Lund, all of Sweden

PCT No. PCT/SE81/00169, § 371 Date Jan. 25, 1982, § 102(e) Date Jan. 25, 1982, PCT Pub. No. WO81/03658, PCT Pub. Date Dec. 24, 1981
PCT Filed Jun. 5, 1981, Ser. No. 354,088
Claims priority, application Sweden, Jun. 16, 1980, 8004465
Int. Cl.³ A61K *31/495*; C07D *241/04*
U.S. Cl. 424—250 **9 Claims**

1. A compound having the formula:

wherein R' is selected from the group consisting of alkyl straight or branch chained having from 2 to 10 carbon atoms, cycloalkyl having from 3 to 8 carbon atoms, aralkyl having from 7 to 9 carbon atoms, phenyl and substituted phenyl wherein the substituents of the substituted phenyl are selected from the group consisting of one to three F, Cl, Br, lower alkyl having from 1 to 5 carbon atoms, lower alkoxy having from 1 to 5 carbon atoms, alkylenedioxy having from 1 to 3 carbon atoms, $—CF_3$ and —CN and pharmaceutically acceptable salts thereof.

7. A method of treating mammals for anti-aggressive purposes comprising administrating an anti-aggressive effective amount of a compound of Formula I as defined in claim 1.

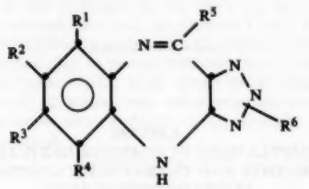
4,492,699

TRIAZOLOBENZODIAZEPINE DERIVATIVES

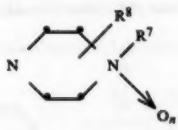
Jiban K. Chakrabarti, Camberley; Terrence M. Hotten, Farnborough, and David J. Steggles, Bracknell, all of England, assignors to Lilly Industries Limited, London, England

Division of Ser. No. 327,143, Dec. 3, 1981, Pat. No. 4,431,589. This application Oct. 13, 1983, Ser. No. 541,605
Claims priority, application United Kingdom, Dec. 11, 1980, 8039659
Int. Cl.³ A61K *31/495*; C07D *487/04*
U.S. Cl. 424—250 **7 Claims**

1. A compound of formula



or an acid addition salt thereof; in which R^1, R^2, R^3 and R^4 independently represent hydrogen, C_{1-4} alkyl, C_{2-4} alkenyl, halogen, C_{1-4} haloalkyl, nitro, C_{1-4} alkoxy, C_{1-4} haloalkoxy, C_{1-4} alkylthio or phenylsulphonyl; in which R^5 is a group of the formula



where R^7 is hydrogen or C_{1-6} alkyl, R^8 is hydrogen or C_{1-4} alkyl and n is 0 or 1, provided that when R^7 is hydrogen n is 0; and in which R^6 is attached to the 1, 2 or 3 position of the triazole ring and is hydrogen, C_{1-10} alkyl, C_{3-7} cycloalkyl, C_{3-7} cycloalkyl C_{1-4} alkyl, phenyl, benzyl or acyl.

6. A pharmaceutical formulation useful for treating CNS disorders comprising an effective amount of a compound as defined in claim 1, or a pharmaceutically-acceptable acid addi-

tion salt thereof, and a pharmaceutically-acceptable diluent or carrier therefor.

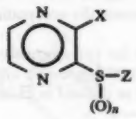
4,492,700

3-HALO-2-THIOPYRAZINES AS ANTIMICROBIAL AGENTS

Arthur J. Friedman, Marlboro, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 24, 1983, Ser. No. 544,949
Int. Cl.³ C07D *241/16;* A61K *31/495*
U.S. Cl. 424—250 9 Claims

1. A compound represented by the formula:



wherein:

X is a chloro or bromo radical;

Z is a chloro, bromo, amino, amino mono- and di-substituted by lower alkyl, 3-halo-pyrazinyl-2-thio, cyano,

—C(S)—NR_3R_4,

wherein R_3 and R_4 independently are methyl or ethyl, benzylidineamino, lower alkyl substituted benzylidineamino group; and

n is 0 or 1, provided that when n is 1, Z is a benzylidineamino or lower alkyl substituted benzylidineamino group.

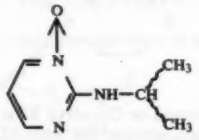
4,492,701

ISOPROPYLAMINO PYRIMIDINE DERIVATIVE ITS PREPARATION AND THERAPEUTIC COMPOSITIONS CONTAINING THE SAME

André Esanu, Paris, France, assignor to Societe de Conseils de Recherches et d'Applications Scientifiques, Paris, France

Filed Sep. 29, 1982, Ser. No. 427,924
Claims priority, application United Kingdom, Oct. 16, 1981, 8131201
Int. Cl.³ A61K *31/505;* C07D *239/42*
U.S. Cl. 424—251 7 Claims

1. 2-isopropylamino-pyrimidine-N-oxide of the formula:



and therapeutically acceptable salt thereof.

2. A therapeutic composition for nervous regeneration comprising in a pharmaceutically acceptable carrier a compound according to claim 1 in an amount effective to induce nervous regeneration.

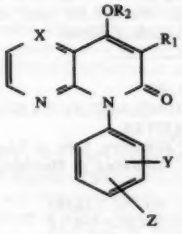
4,492,702

1-PHENYL-1,8-NAPHTHRIDIN-2(1H)-ONES

Margaret H. Sherlock, Bloomfield, N.J., assignor to Schering Corporation, Madison, N.J.

Continuation-in-part of Ser. No. 438,681, Nov. 3, 1982, abandoned. This application Sep. 19, 1983, Ser. No. 533,674
Claims priority, application European Pat. Off., Apr. 20, 1983, 83103839.3
Int. Cl.³ A61K *31/435;* C07D *471/04*
U.S. Cl. 424—256 47 Claims

1. A compound having the structural formula I



I

wherein

X is CH;

Y is hydrogen, hydroxy, benzyloxy, amino, sulfamyl, halogen, nitro, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, carboxylic acyl having from 2 to 6 carbon atoms, alkyl-$S(O)_m$- having from 1 to 6 carbon atoms wherein m is 0, 1 or 2, trifluoromethyl, trifluoromethylthio, or COOA wherein A is hydrogen, alkyl having from 1 to 6 carbon atoms or a cation derived from a pharmaceutically acceptable metal or an amine;

Z is hydrogen, hydroxy, halogen, alkyl having from 1 to 6 carbon atoms, alkoxy having from 1 to 6 carbon atoms, hydroxyalkyl having from 1 to 6 carbon atoms, or carboxylic acyloxy having from 2 to 6 carbon atoms;

R_1 is alkenyl having from 2 to 10 carbon atoms, alkynyl having from 2 to 10 carbon atoms, cycloalkyl having from 3 to 7 carbon atoms, cycloalkenyl having from 5 to 8 carbon atoms, carboxylic acyl having from 3 to 6 carbon atoms or substituted alkyl having from 1 to 10 carbon atoms which is substituted with a substituent selected from hydroxy, halogen, alkoxy having from 1 to 6 carbon atoms, phenyl, carboxylic acyl having from 2 to 6 carbon atoms, cycloalkyl having from 3 to 7 carbon atoms or carboxylic acyloxy having from 1 to 6 carbon atoms;

R_2 is hydrogen, carboxylic acyl having from 1 to 6 carbon atoms, alkenyl having from 3 to 8 carbon atoms, alkynyl having from 3 to 8 carbon atoms, $R_aR_bN(CH_2)_n$- (wherein R_a and R_b are hydrogen, alkyl having from 1 to 6 carbon atoms and n is an integer of from 2 to 6) hydroxyalkyl having from 2 to 6 carbon atoms, dihydroxyalkyl having from 2 to 6 carbon atoms, hydroxyalkoxyalkyl having from 2 to 8 carbon atoms, or a cation derived from a pharmaceutically acceptable metal or an amine.

4,492,703
4-(2-SUBSTITUTED PHENYL)-1,4-DIHYDROPYRIDINE-3,5-DICARBOXYLIC ACID ESTERS ACTIVE ON BLOOD CIRCULATION

Siegfried Goldmann, Wuppertal; Horst Böshagen; Jürgen Stoltefuss, both of Haan; Matthias Schramm, Cologne; Günter Thomas, and Stanislav Kazda, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

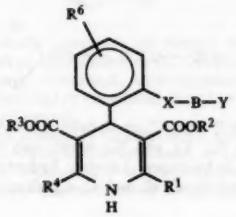
Filed Feb. 22, 1983, Ser. No. 468,819

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1982, 3207982

Int. Cl.³ A61K *31/455*; C07D *211/82*

U.S. Cl. 424—266 13 Claims

1. A 1,4-dihydropyridine of the formula



in which

R^1 and R^4 each independently is hydrogen or an alkyl radical having up to 6 carbon atoms which optionally contains 1 or 2 chain members independently selected from the group consisting of O, CO and NH,

R^2 and R^3 each independently is an alkyl or alkenyl radical having up to 6 carbon atoms, which is optionally substituted by halogen, hydroxyl, cyano, amino, monoalkylamino, dialkylamino or alkyl-benzylamino, the alkyl radicals mentioned each containing 1 to 4 carbon atoms,

R^6 is 1 or 2 substituents independently selected from the group consisting of hydrogen, chloro, nitro and alkyl or alkoxy each having 1 to 4 carbon atoms,

X is a bridging member selected from the group consisting of O and S,

B is an alkylene group having 1 to 4 carbon atoms or a direct bond (excepting X—B—Y=—O—O—), and

y is cyclohexyl, being either directly bonded to B or bonded to B via a hetero member selected from the group consisting of O, S, SO, SO_2, NH and N-alkyl having 1 to 4 carbon atoms, and optionally containing substituents independently selected from the group consisting of nitro, halogen, trifluoromethyl, cyano, hydroxyl, phenyl, ethoxycarbonyl and alkyl or alkoxy each having 1 to 4 carbon atoms,

or a pharmaceutically acceptable addition salt thereof.

12. A method of lowering blood pressure in human and non-human animals which comprises administering to such animal a hypotensive amount of a compound or salt according to claim 1.

4,492,704
QUINOLINE QUINONES AND ANTI-ASTHMATIC USE THEREOF

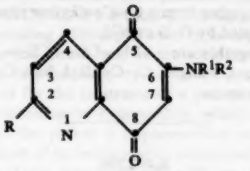
Jerome H. Fleisch, Indianapolis; Winston S. Marshall, Bargersville, and George J. Cullinan, Trafalgar, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 30, 1982, Ser. No. 430,895

Int. Cl.³ A61K *31/505*, *31/47*; C07D *215/24*, *401/04*

U.S. Cl. 424—269 19 Claims

1. A compound of formula (I):



(I)

wherein

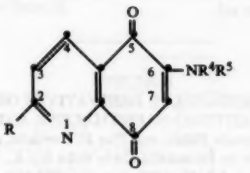
R is hydrogen or C_1–C_3 alkyl;

R^1 and R^2 are hydrogen; C_3–C_6 cycloalkyl; C_2–C_6 alkenyl; tetrahydronaphthyl; together with the nitrogen atom form a morpholine ring; or phenyl substituted by R^3; and

R^3 is hydrogen; C_1–C_6 alkyl, except ortho ethyl, and para methyl; C_2–C_6 alkenyl; C_1–C_6 alkoxy; halo, except para chloro; trifluoromethyl, except in the para position; nitro; hydroxy; C_1–C_3 alkylthio; or C_1–C_3 alkylcarbonyl;

providing that R^1 and R^2 are not both hydrogen or phenyl, and further providing that R^1 is not phenyl when R and R^2 are hydrogen.

10. A method of treating asthma, which comprises administering a therapeutically-effective amount of a compound of formula (II):



(II)

wherein

R is hydrogen or C_1–C_3 alkyl;

R^4 and R^5 are hydrogen; C_1–C_6 alkyl; C_3–C_6 cycloalkyl; C_2–C_6 alkenyl; di(C_1–C_6 alkyl)amino C_1–C_6 alkyl; tetrahydronaphthyl; together with the nitrogen atom form a morpholine ring; or phenyl substituted by R^3; and

R^3 is hydrogen; C_1–C_6 alkyl, except ortho ethyl; C_2–C_6 alkenyl; C_1–C_6 alkoxy; halo; trifluoromethyl, except in the para position; nitro; hydroxy; C_1–C_3 alkylthio; or C_1–C_3 alkylcarbonyl.

4,492,705
3-AMIDINO-BENZISOTHIAZOLE-1,1-DIOXIDES AND THEIR USE FOR CONTROLLING PESTS

Jozef Drabek, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

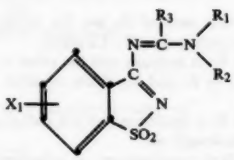
Filed Jan. 31, 1983, Ser. No. 462,256

Claims priority, application Switzerland, Feb. 12, 1982, 888/82; Jan. 7, 1983, 87/83

Int. Cl.³ C07D *275/06*

U.S. Cl. 424—270 9 Claims

1. 3-Amidino-benzisothiazole-1,1-dioxide of the formula I



(I)

wherein

R_1 and R_2 are each C_1–C_5-alkyl or C_2–C_5-alkenyl,

R_3 is hydrogen or methyl, or
R_1 and R_2 together form a C_3–C_6-alkylene chain which can be interrupted by O, S or NH, or
R_1 and R_3 together are —CH_2—CH_2—CH_2—, and
X_1 is hydrogen, halogen, C_1–C_5-alkyl, halo-C_1–C_5-alkyl or C_1–C_5-alkoxy.

4,492,706

METHOD OF LOWERING LIPID LEVELS

Mary-Ann Kallai-Sanfacon, Mount Royal, Canada, assignor to American Home Products Corporation, New York, N.Y.

Filed Aug. 1, 1983, Ser. No. 518,997
Int. Cl.³ A61K *31/425, 31/209, 31/195*
U.S. Cl. 424—270 **9 Claims**

1. A method for lowering lipid levels in a mammal in need thereof which comprises administering to the mammal an effective hypolipidemic amount of a N-naphthoylglycine derivative selected from the group consisting of N-[[5-(trifluoromethyl)-6-methoxy-1-naphthalenyl]thioxomethyl]-N-methylglycine, N-[(5-bromo-1-naphthalenyl)thioxomethyl]-N-methylglycine, N-[[6-methoxy-5-(trifluoromethylthio)-1-naphthalenyl]thioxomethyl]-N-methylglycine, or a therapeutically acceptable salt of one of the aforementioned three compounds with an organic or inorganic base; and 5-hydroxy-2-[5-(trifluoromethyl)-6-methoxy-1-naphthalenyl]-3-methylthiazolium hydroxide, inner salt.

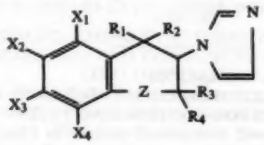
4,492,707

N-IMIDAZOLYL DERIVATIVES OF 1,2,3,4-TETRAHYDRO-NAPHTHALENE AND INDAN

Paolo Cozzi; Antonio Pillan, and Pier P. Lovisolo, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Jul. 15, 1982, Ser. No. 398,545
Claims priority, application United Kingdom, Jul. 23, 1981, 8122689; Aug. 5, 1981, 8123920
Int. Cl.³ A61K *31/415;* **C07D** *233/54*
U.S. Cl. 424—273 R **12 Claims**

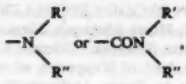
1. A pharmaceutical composition having hypolipaemic activity containing a suitable carrier and/or diluent and a therapeutically effective amount of a compound of formula (I)



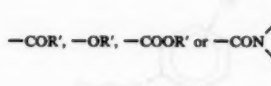
(I)

wherein:
Z completes a bond or is a

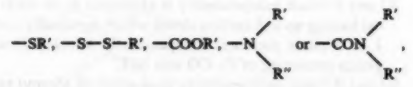
group, wherein each of R_5 and R_6, being the same or different, is hydrogen or C_1–C_4 alkyl;
one of R_1 and R_2 is hydroxy and the other is hydrogen or C_1–C_6 alkyl, or R_1 and R_2, taken together, form an oxo group;
one of R_3 and R_4 is hydrogen or C_1–C_4 alkyl and the other represents hydrogen or:
(a) C_1–C_8 alkyl, unsubstituted or substituted by one or more substituents chosen from halogen; hydroxy, cyano; —COOR′, wherein R′ is hydrogen or C_1–C_6 alkyl;



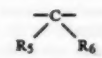
wherein each of R′ and R″, being the same or different, represents hydrogen or C_1–C_6 alkyl;
(b) straight or branched C_1–C_4 alkyl or C_2–C_4 alkenyl, each substituted by a C_1–C_4 alkyl, or a C_3–C_7 monocycloalkyl;
(c) cyano;



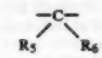
wherein R′ and R″ are as defined above;
each of X_1, X_2, X_3, and X_4, which may be the same or different, is hydrogen; halogen; hydroxy; nitro; cyano, C_1–C_6 alkyl; C_2–C_6 alkenyl; C_1–C_6 alkoxy; trihalo-C_1–C_6 alkyl;



R′ and R″ being as defined above; or a C_2–C_4 acylamino group; or one of X_1, X_2, X_3 and X_4 is phenyl, phenylthio, phenoxy or benzyl, the phenyl, phenylthio, phenoxy or benzyl groups being unsubstituted or substituted by one or more substituents chosen from halogen, C_1–C_6 alkyl, hydroxy, C_1–C_6 alkoxy,—SR′ or —S—S—R′, wherein R′ is as defined above, and the others are as defined above; or any two adjacent X_1, X_2, X_3 and X_4 groups, taken together, complete a saturated or unsaturated 6-membered carbocyclic ring fused to the benzene ring shown in formula (I), the carbocyclic ring being unsubstituted or substituted by one or more substituents selected from halogen, C_1–C_6 alkyl, halo-C_1–C_6 alkyl, C_1–C_6 alkoxy, —SR′ or —S—S—R′, wherein R′ is as defined above, and any groups X_1 to X_4 not participating in the completion of such a fused ring are as defined above; provided that:
when Z is a group



and, at the same time, at least one of R_3 and R_4 is different from hydrogen, then R_5 and R_6 are both hydrogen; and
when Z is a group



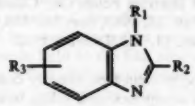
and, at the same time, at least one of R_5 and R_6 is different from hydrogen, then R_3 and R_4 are both hydrogen, or a pharmaceutically acceptable salt thereof.

4,492,708
ANTIVIRAL BENZIMIDAZOLES

Wayne A. Spitzer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 27, 1982, Ser. No. 424,784
Int. Cl.³ A61K *31/415;* **C07D** *235/30, 235/06*
U.S. Cl. 424—273 B **53 Claims**

42. A method of treating or preventing viral infections in mammals comprising administering to a mammal suffering from or exposed to a viral infection and in need of treatment an effective antiviral amount of a compound of the formula



or a pharmaceutically acceptable salt thereof, wherein

R_1 is C_1–C_8 alkyl, C_2–C_8 alkenyl, C_3–C_7 cycloalkyl, C_5–C_7 1-cycloalkenyl, adamantyl, hydroxy-substituted C_1–C_8 alkyl, unsubstituted or substituted phenyl, or unsubstituted or substituted benzyl;

R_2 is hydrogen, amino, C_1–C_4 alkylamino, methylmercapto, hydroxy, C_1–C_4 carboxylic acylamino, or 1-hydroxyethyl;

R_3 is C_2–C_8 alkanoyloxy, unsubstituted or substituted phenylacetoxy, unsubstituted or substituted benzoyloxy, or

Z is oxygen, hydroxyimino, C_1–C_4 alkoxyimino, C_1–C_4 carboxylic acyloxyimino, hydrazono, C_1–C_7 alkylidene, =CHBr, =CHCl, =CHCN, =CHCONH$_2$, or =CHCO$_2$(C_1–C_4 alkyl);

R_6 is C_1–C_7 alkyl, C_3–C_7 cycloalkyl, (C_3–C_7 cycloalkyl)-methyl, 2-(C_3–C_7 cycloalkyl)ethyl, unsubstituted or substituted benzyl, or unsubstituted or substituted phenyl wherein the substituents on the phenyl, benzyl, phenylacetoxy and benzoyloxy rings are one to three of C_1–C_4 alkyl, C_1–C_4 alkoxy, fluoro, chloro, bromo, iodo, nitro, amino or trifluoromethyl; and

R_3 is at the 5 or 6 position,

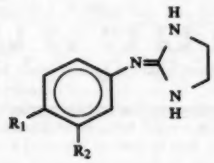
subject to the limitation that when R_2 is hydroxy, R_1 may only be C_5–C_7 1-cyclolkenyl.

4,492,709
2-[4(3)-AMINO-3(4)-HYDROXYPHENYLIMINO]-IMIDAZOLINES, USEFUL IN THE TREATMENT OF GASTRIC HYPERSECRETION AND HYPERACIDITY

Thomas A. Purcell, Fontenay aux Roses, France, assignor to Synthelabo, Paris, France

Filed Jan. 25, 1983, Ser. No. 460,993
Claims priority, application France, Feb. 5, 1982, 82 01877
Int. Cl.³ A61K *31/415;* **C07D** *231/06*
U.S. Cl. 424—273 R **8 Claims**

1. An imidazolidine compound of the formula:



wherein R_1 represents the hydroxy radical and R_2 represents a grouping, —NHCOR′ or —NHCONR′R″, R′ and R″ independently of one another representing a hydrogen atom or an alkyl radical of 1 through 4 carbon atoms, or alternatively R_2 represents the hydroxy radical and R_1 represents a grouping —NHCOR′ or —NHCONR′R″, R′ and R″ independently of one another representing a hydrogen atom or an alkyl radical of 1 through 4 carbon atoms, and pharmacologically-acceptable acid additions salts thereof.

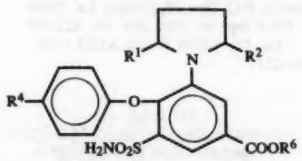
8. A method for the treatment of a patient suffering from gastric hypersecretion or hyperacidity, which comprises administering to the patient a hypersecretion or hyperacidity reducing amount of an imidazolidine compound of claim 1, or a pharmacologically-acceptable acid addition salt thereof.

4,492,710
SUBSTITUTED PYRROLIDINYL-BENZOIC ACID DERIVATIVES AND A PROCESS FOR THEIR MANUFACTURE

Wulf Merkel; Dieter Bormann, both of Kelkheim, and Roman Muschaweck, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 146,017, May 2, 1980, abandoned. This application Sep. 22, 1982, Ser. No. 421,030
Claims priority, application Fed. Rep. of Germany, May 4, 1979, 29179973
Int. Cl.³ A61K *31/44, 31/40;* **C07D** *207/327, 401/12*
U.S. Cl. 424—274 **7 Claims**

1. A substituted pyrrolidinylsulfamoylbenzoic acid compound of the formula



or a pharmaceutically acceptable salt thereof with an acid or a base, wherein

R^1 and R^2 are the same or different and are both methyl having 1 to 4 carbon atoms or wherein one of R^1 or R^2 is hydrogen and the other is such methyl;

R^4 is methyl or ethyl; and

R^6 is hydrogen or alkyl having 1 to 4 carbon atoms.

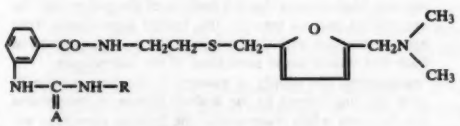
5. A saluretic and diuretic pharmaceutical composition comprising a saluretically- and diuretically-effective amount of a compound or salt as in claim 1 and a pharmaceutically acceptable carrier therefor.

4,492,711
BENZAMIDES, THEIR SALTS, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Dino Nisato, Pavia, and Sergio Boveri, Tortona, both of Italy, assignors to SANOFI, Paris, France

Filed Jul. 6, 1983, Ser. No. 511,107
Claims priority, application France, Aug. 13, 1982, 82 14125
Int. Cl.³ A61K *31/34;* **C07D** *307/54*
U.S. Cl. 424—285 **5 Claims**

1. A benzamide of formula



wherein A represents an oxygen or sulfur atom, an N—CN or a CH—NO_2 group, and R represents an alkyl group of from 1 to 6 carbon atoms, or a phenyl group; or a pharmaceutically acceptable addition salt thereof.

3. A pharmaceutical composition containing as active ingredient a compound as claimed in one of claim 1 or 2 in admixture with a pharmaceutical carrier.

4,492,712

USE OF HYDROLYZED WHEY PRODUCTS IN FERMENTED SAUSAGES

Linda J. Casella, Ithaca, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 17, 1983, Ser. No. 542,704
Int. Cl.³ A23L *1/31*
U.S. Cl. 426—59 **16 Claims**

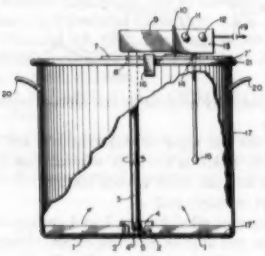
1. A fermented sausage product comprising:
a. a meat or meat by-product containing mixture suitable for making a fermented sausage product, the mixture including a microbial fermentation culture; and
b. an extender comprising lactose hydrolyzed whey which has a protein content of from about 2 to about 90 percent on a dry weight basis and which had, before hydrolysis, a lactose content of from about 5 to about 85 percent on a dry weight basis, which lactose is at least about 30 percent hydrolyzed.

4,492,713

METHOD OF AUTOMATIC ROUX MAKING

John A. Chauvin, P.O. Box 39, Gretna, La. 70054

Filed Sep. 24, 1982, Ser. No. 422,570
Int. Cl.³ G01N *33/00*; A23D *5/00*
U.S. Cl. 426—231 **3 Claims**



1. An automated method of preparing a roux comprising the following steps:
a. providing a cooking pot with an automatically controlled, motor driven agitator having at least one, flexibly mounted blade contacting the bottom of the pot and movable in a sweeping action across and in contact with the full bottom of the pot, and a heat source with a controller system for controlling the amount and duration of the heat supplied to the pot by the heat source and controlling the cut-off of the motor for said agitator;
b. placing in the pot the ingredients for the roux comprising flour and a fat;
c. applying power to the heat source to heat the pot and said ingredients and to the motor for the agitator to drive the agitator blade across the full bottom of the pot to mix the ingredients and to prevent the heated ingredients from being in contact with the bottom of the pot for a period of time that would cause scorching of the ingredients;
d. maintaining the supply of energy to the heat source to cook the ingredients to the desired degree of brownness for the roux while maintaining the bottom sweeping action of the agitator, and then terminating the heat to the pot but maintaining the bottom sweeping action of the agitator; and
e. terminating the bottom sweeping action of the agitator by means of the controller system after the temperature of the roux in the pot has dropped down to a temperature level which will not scorch the ingredients.

4,492,714

NON-PROTEIN, HIGH STABILITY FAT EMULSION COMPOSITION AND METHOD OF PRODUCTION

Stephen E. Cooper, and Donald L. Leohner, both of Menomonie, Wis., assignors to Beatrice Foods Co., Chicago, Ill.

Filed Feb. 25, 1983, Ser. No. 469,900
Int. Cl.³ A23D *5/00, 5/02*
U.S. Cl. 426—602 **25 Claims**

1. A high stability, protein-free, rapidly cold water soluble, fat emulsion, which comprises on a solids basis:
(a) 10 to 75% of an edible fat having an average particle size of 4 microns or less;
(b) 0.1 to 3% of an edible emulsifier; and
(c) 8 to 20%, based on the weight of the fat, of an edible, hydrated, substantially undextrinized lipophilic starch, which is predominately in a submicroscopic form;
the remainder of the solids being principally an edible filler.

4,492,715

USE OF HYDROLYZED WHEY PRODUCTS IN COMMINUTED MEAT PRODUCTS

Linda J. Casella, Ithaca, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 17, 1983, Ser. No. 542,748
Int. Cl.³ A23L *1/31*
U.S. Cl. 426—646 **20 Claims**

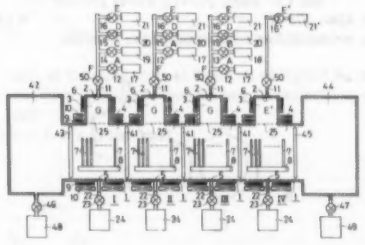
1. A comminuted meat product comprising:
a. a meat or meat by-product containing mixture suitable for making a comminuted meat product; and
b. an extender comprising lactose hydrolyzed whey which has a protein content of from about 2 to about 90 percent on a dry weight basis and which had, before hydrolysis, a lactose content of from about 5 to about 85 percent on a dry weight basis, which lactose is at least about 30 percent hydrolyzed.

4,492,716

METHOD OF MAKING NON-CRYSTALLINE SEMICONDUCTOR LAYER

Shunpei Yamazaki, 21-21 Kitakarasuyama 7-chome, Setagaya-ku, Tokyo, Japan

Division of Ser. No. 177,889, Aug. 14, 1980, abandoned. This application May 12, 1982, Ser. No. 377,314
Claims priority, application Japan, Aug. 16, 1979, 54/104452
Int. Cl.³ B05D *5/12*
U.S. Cl. 427—38 **13 Claims**



1. A multi-layer, non-single crystal semiconductor manufacturing method which employs a plurality of sequentially ar-

ranged reaction chambers separated from one another by normally closed shutter means, the reaction chambers being each provided with a gas inlet and a gas outlet, said method comprising the steps of:

positioning a substrate in a first one of the reaction chambers;

depositing a first silicon compound including hydrogen or a halogen on the substrate to form thereon a first non-single-crystal silicon layer of either one of N, I and P conductivity types by introducing at least a gas of said first silicon compound into the first reaction chamber through the gas inlet thereof in such a state that gas in the first reaction chamber is exhausted therefrom through the gas outlet thereof and by applying a first ionizing high-frequency electromagnetic field to the first silicon compound gas to ionize it into a first silicon compound gas plasma while at the same time passing the first silicon compound gas plasma into the first reaction chamber by discharging the gas in the first reaction chamber and maintaining the atmospheric pressure in the first reaction chamber below 1 atm and the temperature of the first substrate below 700° C. which is lower than that for single-crystalling the first silicon deposited on the substrate;

displacing the shutter means between the first reaction chamber and a second reaction chamber adjacent thereto and moving the substrate from the first reaction chamber to the second reaction chamber while at the same time evacuating entirely the first and second reaction chambers or passing therethrough only carrier gases and then closing the shutter means between the first and second reaction chambers;

depositing a second silicon compound including hydrogen or a halogen on the first non-single-crystal silicon layer to form thereon a second non-single-crystal silicon layer of other one of N, I and P conductivity type by introducing a gas of at least said second silicon compound into the second reaction chamber through the gas inlet thereof in such a state that gas in the second reaction chamber is exhausted therefrom through the gas outlet thereof and by applying a second ionizing high-frequency electromagnetic field to the second silicon compound gas to ionize it into a second silicon compound gas plasma while at the same time passing the second silicon compound gas plasma into the second reaction chamber and maintaining the atmospheric pressure in the second reaction chamber below 1 atm and the temperature of the first substrate below 700° C. which is lower than that for single-crystallizing the second silicon deposited on the first non-single-crystal silicon layer; whereby to fabricate the multi-layer, non-single-crystal semiconductor having a PN, PI, NP, NI, IP or IN junction and in each step while a shutter is open between adjacent chambers, no plasma is energized in those chambers.

4,492,717

METHOD FOR FORMING A PLANARIZED INTEGRATED CIRCUIT

William A. Pliskin, and Jacob Riseman, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

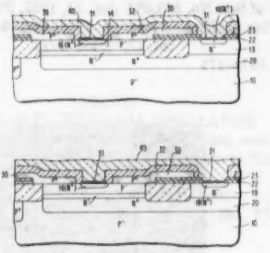
Filed Jul. 27, 1981, Ser. No. 287,467
Int. Cl.³ H01L *21/316*
U.S. Cl. 427—96 **19 Claims**

1. A method for forming a planarized integrated circuit structure comprising:

providing an integrated circuit intermediate product having devices formed therein but before metallurgy has been formed on a principal surface of said product and having a non-planar surface composed of many step-like irregularities;

non-conformally depositing preferentially upon the horizontal surfaces of said irregularities a glass layer having a thermal coefficient of expansion that approximates that of silicon and has a softening temperature of less than about 1200° C. onto said surface;

heating the structure to cause the flow of said glass on said surface to fill in the said irregularities therein and to planarize said surface;



forming openings through said glass down to the device elements of said integrated circuit; and

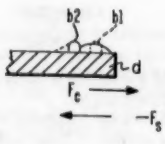
forming an interconnection metallurgy over and through said openings in said glass to interconnect said device elements of said integrated circuit.

4,492,718

ROTATION COATING OF DISK SUBSTRATE WITH ACRYLATE PREPOLYMER

Thomas Mayer; Michael D. Temple; Norman L. Boling, and James D. Rancourt, all of Santa Rosa, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 17, 1982, Ser. No. 450,779
Int. Cl.³ B05B *5/00*
U.S. Cl. 427—160 **24 Claims**



1. A method of applying a relatively "hard" outer-seal coating of moderate-to-high viscosity to a disk substrate to yield very high thickness uniformity, this substrate including at least one recording area wherein information is to be recorded with prescribed radiation, the method comprising the steps of:

formulating a coating mixture to comprise the polymerization product of a formulation including at least one acrylate pre-polymer;

applying this mixture in a prescribed stream to the outer surface of the recording area, while rotating it at a prescribed rpm, so as to form one or several annular bead segments, extending circularly or spirally about the disk surface;

the mixture being so formulated and so applied as to be capable of leveling and so rendering the desired coating; this coating serving as a mechanical/chemical barrier, while also being relatively transparent to said radiation.

4,492,719

PROCESS FOR THE PRODUCTION OF SLIPPERY BIAXIALLY STRETCHED POLYESTER FILMS

Tamaki Kanai, Sagamihara; Hirofumi Yoshikawa, Hachioji; Takashi Yamagishi, Yokohama; Kenji Suzuki, and Yoshikatsu Ohta, both of Sagamihara, all of Japan, assignors to Teijin, Limited, Osaka, Japan

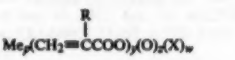
Division of Ser. No. 338,652, Jan. 11, 1982, Pat. No. 4,439,479. This application Nov. 21, 1983, Ser. No. 555,006

Int. Cl.³ B05P 3/12

U.S. Cl. 427—171 15 Claims

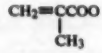
1. A process for producing a slippery biaxially stretched polyester film, which comprises coating one or both surfaces of a running polyester film, before the completion of its crystalline orientation, with an aqueous solution or dispersion containing

(A) a metal salt having the composition of the following formula



(I)

wherein Me represents a metal ion having a valence of 2 to 6, R is a hydrogen atom or a methyl group, X is one equivalent of an anion, y is a number of from 1 to 6, z is a number of from 0 to 2, w is a number of from 0 to 8, and p is a number equal to the quotient obtained by dividing the total of y+2z+w by the atomic valence of Me, provided that when y is a number of 2 or more, two or more R groups may be identical or different, when w is a number of 2 or more, two or more X ions may be identical or different, and the group



in the case of R=methyl is contained in a number of not more than 2 for each Me,

and (B) a film-forming polymeric compound, a monomer thereof, or a mixture of these; and thereafter heating the coating, before completion of the crystalline orientation of the film, to convert it on the film surface into numerous minute protrusions substantially having form retention.

4,492,720

METHOD OF PREPARING MICROSPHERES FOR INTRAVASCULAR DELIVERY

Benjamin Mosier, 5139 S. Braeswood, Houston, Tex. 77096

Filed Nov. 15, 1983, Ser. No. 552,160

Int. Cl.³ B01J 13/02

U.S. Cl. 427—213.3 18 Claims

1. The method of preparing microspheres containing therapeutic or diagnostic agents, comprising:

(a) preparing a solution by dissolving said agent and a nontoxic matrix material in a first organic solvent in which they are mutually soluble, said matrix material being heat-liquifiable and having a congealing temperature above 100° F., said first organic solvent having a dielectric constant above 15;

(b) dispersing the prepared solution in a second organic solvent to form an emulsion containing dispersed droplets of said solution in said second solvent as the continuous phase, said second organic solvent having a dielectric constant below 5, and being present in at least as great a volume as said solution;

(c) removing substantially all of both of said solvents from said dispersion while maintaining said droplets at a temperature substantially below the congealing temperature of said matrix material to produce solid microspheres comprising said matrix material with said water-soluble agent distributed therein; and

(d) recovering said microspheres.

4,492,721

METHOD OF PROVIDING MAGNESIUM FLUORIDE LAYERS

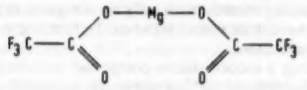
Paul H. Joosten; Theo J. A. Popma; Hendrikus J. P. Nabben; Henricus A. M. Van Hal, and Jan Haisma, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,518

Claims priority, application Netherlands, May 10, 1983, 8301652

Int. Cl.³ B05D 3/02

U.S. Cl. 427—226 15 Claims



1. A method of providing a layer of magnesium fluoride on a substrate in which a solution of a fluorine-containing magnesium compound is contacted with the substrate and the resultant layer of the solution formed on the substrate is treated thermally, characterized in that a solution of a fluorine-containing organic magnesium compound, which comprises at least six fluorine atoms per magnesium atom, is contacted with the substrate and the resultant layer of the solution formed on the substrate is treated thermally while forming magnesium fluoride by disproportionation.

4,492,722

PREPARATION OF GLASS-CERAMIC FIBERS

George W. Ritter, II, Newark, and Leonard J. Adzima, Pickerington, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 25, 1983, Ser. No. 517,106

Int. Cl.³ B05D 3/02; C03C 17/00

U.S. Cl. 427—226 7 Claims

1. A method of treating S glass fibers which comprises depositing a metallic compound consisting essentially of a titanium-organo complex on the surface of the heat cleaned glass fibers to deposit up to about 15 weight percent titanium dioxide on the glass fibers after heat treating, and heat treating the glass fibers at a temperature within the range of from about 1700° to about 2100° F. for a period of up to about 3 hours to convert said titanium-organo complex to said titanium dioxide and to convert said glass to a stabilized glass ceramic material.

4,492,723

CURVILINEAR POLYHEDRAL CONSTRUCTION KIT

Lee S. Chadwick, II, R.F.D. #2 Box 138, Randolph, Vt. 05060

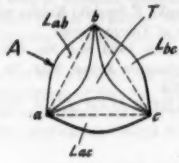
Filed Oct. 14, 1982, Ser. No. 434,175

Int. Cl.³ A63H 33/16

U.S. Cl. 428—7 40 Claims

1. A construction kit for forming an entirely curvilinearly faced polyhedron, all surfaces of which are curved surfaces

laterally define exclusively by arcs, from a plurality of polygonal planar components defined exclusively by arcuate edges



and being scored exclusively along arcuate interior lines to form arcuately defined polygons to facilitate the folding and assembly of said components to form said polyhedron.

4,492,724

HUMIDITY-RESISTANT WET-STICK ADHESIVES

Charles T. Allbright, Covina, and Dennis S. Culp, Rancho Cucamonga, both of Calif., assignors to Avery International Corp., Pasadena, Calif.

Filed Jul. 13, 1982, Ser. No. 397,837
Int. Cl.³ B32B 7/06, 7/10
U.S. Cl. 428—40 **12 Claims**

1. A humidity-resistant wet-stick pressure-sensitive composition comprising, based on the total weight of the dry adhesive:

(a) from about 20 to about 55 percent by weight of a substantially non-water-soluble backbone polymer system comprised of a normally solid, elastomeric interpolymer of vinyl acetate and acrylic acid, and a normally solid, brittle copolymer provided for cohesive strength;

(b) from about 8 to about 35 percent by weight of an acrylic acid polymer system having an average molecular weight of between about 70,000 and 90,000 and capable of absorbing moisture from a wet surface without loss of cohesive strength or tack of the adhesive composition; and

(c) from about 20 to about 65 percent by weight of a tackifier system comprising at least one nonionic surfactant which is an alkylaryl polyether present in an amount sufficient to induce pressure-sensitive adhesive properties to the composition.

12. A pressure-sensitive adhesive label stock comprising a face material laminated to a release liner by an adhesive which is a humidity-resistant wet-stick pressure-sensitive composition comprising, based on the total weight of the dry adhesive:

(a) a backbone polymer system comprising:

(i) from about 20 to about 22 percent by weight of the adhesive composition of an elastomeric, normally solid interpolymer comprised of vinyl acetate, acrylic acid and 2-ethylhexyl acrylate; and

(ii) from about 13.5 to about 14.5 percent by weight of the adhesive composition of a copolymer comprising methacrylic acid and ethyl acrylate;

(b) an acrylic acid polymer system comprising:

(i) from about 8 to about 9 percent by weight based on the weight of the adhesive composition of an acrylic acid homopolymer having an average molecular weight of about 100,000;

(ii) from about 4 to about 5 percent by weight based on the weight of the adhesive composition of an acrylic acid homopolymer having an average molecular weight of about 60,000;

(c) a tackifier system comprising:

(i) from about 30 to about 35 percent by weight based on the weight of the adhesive composition of an octyl phenol adduct of an ethylene oxide polymer containing from about 12 to about 14 ethylene oxide units per molecule;

(ii) from about 8 to about 9 percent by weight based on the weight of the adhesive composition of a nonyl phenol adduct of an ethylene oxide polymer containing from about 9 to about 10 ethylene oxide units in the molecule; and

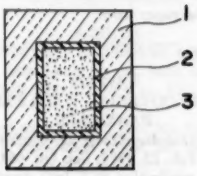
(iii) from about 8 to about 9 percent by weight based on the weight of the adhesive composition of an octyl phenol adduct of an ethylene oxide polymer containing about 40 ethylene oxide units per molecule.

4,492,725

COMPOSITE THERMAL INSULATOR

Shoichi Ishihara, Katano; Hiroshi Yoneno, Nara, and Ryoichi Yamamoto, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 18, 1983, Ser. No. 514,980
Claims priority, application Japan, Jul. 20, 1982, 57-126910; Dec. 16, 1982, 57-221404
Int. Cl.³ B32B 5/16, 5/18
U.S. Cl. 428—69 **8 Claims**



1. A composite thermal insulator which comprises an expanded plastic, a film-like plastic container evacuated to form a vacuum in its interior and partly or entirely covered by said expanded plastic, and activated carbon tightly enclosed within said plastic container.

4,492,726

HIGH WET STRENGTH WAFERBOARD

George N. Rosenberg, British Columbia, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Continuation-in-part of Ser. No. 388,977, Jun. 16, 1982, abandoned. This application Jun. 16, 1983, Ser. No. 504,869
Int. Cl.³ B32B 23/02
U.S. Cl. 428—192 **16 Claims**

1. A waferboard panel comprising wood wafers having an initial average specific gravity based on oven dry weight with volume at 12% moisture content, of less than about 0.6, said wood wafers having a length of at least about 1.5 inches and a width in the range of about 0.125 to 1.5 inches, adhesive resin in the range of about 4% to 10% by weight of the wood wafers, at least a portion of the wood wafers being oriented generally in a lengthwise direction, such that the length to width strength ratio of the waferboard panel, measured as modulus of rupture, is in the range of about 1.3:1 to 2:1,

the waferboard panel having a density in the range of about 38 to 45 lb/ft^3,

the fully soaked waferboard panel having a moisture content of at least about 30%, with an MOR lengthwise greater than about 2900 lb/in^2 and an MOE lengthwise greater than about 0.9×10^6 lb/in^2,

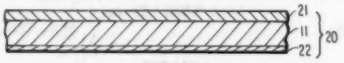
and the waferboard panel having a weight gain of not more than about 14% after a ten week exterior exposure.

4,492,727

INK DONOR SHEET

Toshiharu Inui, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1982, Ser. No. 438,186
Claims priority, application Japan, Oct. 30, 1981, 56-172894
Int. Cl.³ B41M 5/26
U.S. Cl. 428—216 6 Claims



1. An ink donor sheet recording medium consisting essentially of a paper base;

an ink layer on a surface of the paper base, the ink layer comprising a solidified ink composition capable of being heat-transferred to a recording paper brought into contact with the ink layer upon heating through the paper base; and

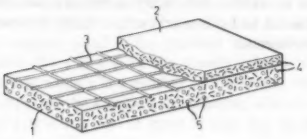
a dampproof layer comprising a silicone resin on the opposite surface of the paper base to prevent absorption of moisture in the paper base.

4,492,728

SPORTS GROUND COVERING WITH EXPANDED CLAY PARTICLES

Pierre Zurkinden, Obholzerstrasse 22, Birchwil, Switzerland

Filed Feb. 22, 1983, Ser. No. 468,497
Claims priority, application PCT Int'l Appl., Feb. 19, 1982, CH82/00024
Int. Cl.³ B32B 5/16
U.S. Cl. 428—240 2 Claims



1. A sports ground covering comprising a lower layer (1) for cushioning or damping impact effects on the covering, an upper wear-resisting coating (2) applied thereto and an intermediate reinforcing netting (3) for stabilizing the cushioning layer (1), the two layers (1, 2) containing rubber chips (4) bound with polyurethane, said lower layer (1) also containing expanded clay (5) interspersed therein.

4,492,729

COHESIVE FIBROUS MAT FOR IN-TRANSIT PARTICULATE CONTROL

Wyburn G. Bannerman, Ferndale, and Charles H. Ludwig, Waldron Island, both of Wash., assignors to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Oct. 8, 1982, Ser. No. 433,458
Int. Cl.³ B32B 5/16
U.S. Cl. 428—283 30 Claims

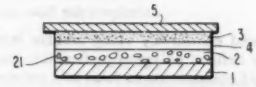
1. A protected mass of wood chips comprising a mass of wood chips wherein at least a substantial portion of the exposed surface is a cohesive fibrous mat comprising said wood chips bound by cellulosic fibrous material and gelatinized starch, said cohesive fibrous mat being essentially only on the surface of said mass of wood chips.

4,492,730

SUBSTRATE OF PRINTED CIRCUIT

Naoaki Oishi, Machida; Noriyuki Shimizu, Saitama; Takashi Shoji, Chichibu, and Shoji Harada, Asaka, all of Japan, assignors to Showa Denko Kabushiki Kaisha and Nikkan Industries Co., Ltd., both of Tokyo, Japan

Filed Mar. 28, 1983, Ser. No. 479,236
Claims priority, application Japan, Mar. 26, 1982, 57-47075; Mar. 26, 1982, 57-47076
Int. Cl.³ B32B 15/08, 27/36, 27/28
U.S. Cl. 428—328 11 Claims



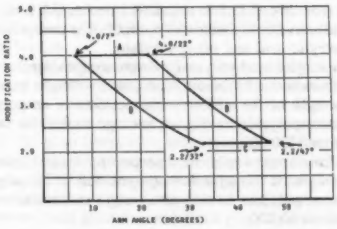
1. A substrate of a printed circuit comprising a metallic plate, and further comprising on at least one surface of said metallic plate, (a) a synthetic resin layer containing an inorganic filler in an amount of from 10 to 300 parts by volume based on 100 parts by volume of synthetic resin, (b) a heat-resistant resin film wherein said heat-resistant resin film consists of a material selected from the group consisting of polyimide, polyparabanic acid and polyester, and (c) a synthetic resin layer free of inorganic filler, wherein each of said layers (a), (b) and (c) are successively laminated on said metallic plate, and wherein the resin of said synthetic resin layers (a) and (c) are selected from the group consisting of epoxy, phenol, polyimide, unsaturated polyester, BT resins, modified polyethylene, polysulfonic acid and polyphenylene sulfide.

4,492,731

TRILOBAL FILAMENTS EXHIBITING HIGH BULK AND SPARKLE

Vilas G. Bankar, Seaford; Terry L. Stuchlik, Newark, and Frank Werny, Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 22, 1982, Ser. No. 443,864
Int. Cl.³ D02G 3/00
U.S. Cl. 428—362 4 Claims

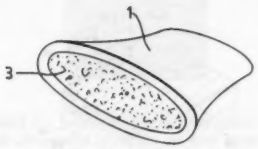


1. Trilobal synthetic polymer filaments for carpet yarn having high bulk and high sparkle, said filaments having a cross-section consisting of three substantially equi-spaced, integrally joined arms of substantially similar shape and size, said cross-section having a modification ratio and arm angle within the range represented by the area enclosed by sides A,B,C, and D on FIG. 2 of the drawing.

4,492,732
MATERIALS SUITABLE FOR THERMOSETTING

Davis J. Murphy, Church Crookham, and Leslie N. Phillips, Farnborough, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, England

Division of Ser. No. 417,516, Sep. 13, 1982, Pat. No. 4,405,543, which is a continuation of Ser. No. 139,733, Apr. 11, 1980, abandoned. This application May 18, 1983, Ser. No. 495,699
Claims priority, application United Kingdom, Apr. 20, 1979, 7913896
Int. Cl.³ B32B *5/16*
U.S. Cl. 428—404 5 Claims



1. A material suitable for thermosetting including a collection of hollow particles having average diameters in the inclusive range of 20 μm to 150 μm, each particle coated with a curable thermosetting resin, said resin being presented in the material in an amount not less than 45% by weight such that the mixture exists in a granular form of discrete individual grains, each grain having an and average diameter of about 2 mm. or less and including one or more of said resin-coated hollow particles such that each grain remains separate from other grains, said mixture being convertible by thermosetting to a fused solid mass having a density not greater than 0.5 grams per cubic centimeter.

4,492,733
METHOD OF MAKING AN ABRASION RESISTANT COATING ON A SOLID SUBSTRATE AND ARTICLES PRODUCED THEREBY

Richard A. Phillips, Acton, and Theodore A. Haddad, Leominster, both of Mass., assignors to Foster Grant Corporation, Leominster, Mass.

PCT No. PCT/US83/01260, § 371 Date Jan. 23, 1984, § 102(e) Date Jan. 23, 1984, PCT Pub. No. WO84/00722, PCT Pub. Date Mar. 1, 1984
Continuation-in-part of Ser. No. 409,272, Aug. 18, 1982, Pat. No. 4,435,476. This PCT application Aug. 17, 1983, Ser. No. 577,616
The term of this patent subsequent to Mar. 6, 2001 has been disclaimed.
Int. Cl.³ B32B *27/12, 27/30*
U.S. Cl. 428—412 18 Claims

1. A method of improving the abrasion resistance of cross-linked organosiloxane coating, said coating having been prepared by applying to a solid substrate an organosiloxane coating liquid comprising as a main ingredient organosilanol molecules, at least 90 mole percent of which being trifunctional silanols of the formula $RSi(OH)_3$ where R is a hydrocarbon radical, and at least 50 mole percent of said trifunctional silanols being an alkyltrisilanol of 1–3 carbons or phenyltrisilanol, or a percursor thereof or a partial hydrolysis product thereof and by curing the resultant coating in order to obtain an abrasion resistant, cross-linked organosiloxane coating, which method comprises a glow discharge treatment of said cross-linked organosiloxane coating under a pressure range of from about 5 to about 150 microns.

7. A solid substrate coated with an abrasion-resistant cross-linked organosilane coating comprising the cross-linked condensation product of organosilanol molecules at least 90 mole percent of which being trifunctional silanols of the formula $RSi(OH)_3$ where R is a hydrocarbon radical, and at least 50 mole percent of said trifunctional silanols being an alkyltrisilanol of 1–3 carbons or phenyltrisilanol, a precursor thereof or a partial hydrolysis product thereof that has been glow discharge treated at a pressure of 5–150 microns subsequent to condensation and crosslinking.

4,492,734
MAGNETIC RECORDING MEDIUM

Hiroshi Ogawa, and Yasuo Tamai, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 1, 1983, Ser. No. 518,843
Claims priority, application Japan, Jul. 30, 1982, 57-132067
Int. Cl.³ B32B *27/30*
U.S. Cl. 428—424.2 10 Claims

1. A magnetic recording medium comprising a non-magnetic support and a magnetic layer provided thereon, said layer comprising a ferromagnetic powder dispersed in a binder consisting essentially of a copolymer of 50 to 95 percent by weight of vinyl chloride, 0.5 to 20 percent by weight of ethylene, 0.5 to 20 percent by weight of vinyl acetate, and 0.5 to 5 percent by weight of maleic anhydride, wherein the copolymer has a degree of polymerization of 200 to 2000.

4,492,735
MAGNETIC RECORDING MEDIUM

Hiroshi Ogawa, and Yasuo Tamai, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

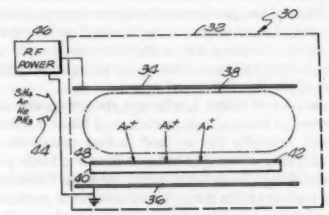
Filed Aug. 1, 1983, Ser. No. 518,844
Claims priority, application Japan, Jul. 30, 1982, 57-132068
Int. Cl.³ B32B *27/30*
U.S. Cl. 428—424.2 9 Claims

1. A magnetic recording medium comprising a non-magnetic support and a magnetic layer provided thereon, said layer comprising a ferromagnetic powder dispersed in a binder consisting essentially of a copolymer of 50 to 95 percent by weight of vinyl chloride, 0.5 to 20 percent by weight of ethylene, 0.5 to 20 percent by weight of vinyl acetate, and 1 to 15 percent by weight of vinyl alcohol, wherein the copolymer has a degree of polymerization of 200 to 2000.

4,492,736
PROCESS FOR FORMING MICROCRYSTALLINE SILICON MATERIAL AND PRODUCT

David P. Tanner, Thousand Oaks, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 29, 1983, Ser. No. 537,132
Int. Cl.³ B32B *9/04*
U.S. Cl. 428—446 16 Claims



1. A process for forming microcrystalline silicon comprising the steps of:

introducing a silicon-containing gas, hydrogen gas and a relatively inert gas into a work environment to form a preselected gas atmosphere;

the relative concentration of the inert gas being no less than approximately 10 volumetric percent and no more than approximately 50 volumetric percent, and the gas atmosphere being maintained at a flow rate of no more than

approximately 5×10^{-3} SCCM per cubic centimeter within the work environment;

establishing a glow discharge through the gas atmosphere; at a power level less than 0.3 watts per square centimeter; and

exposing a substrate to the glow discharge to form a microcrystalline thin film of silicon thereon.

4,492,737

COMPOSITE METALLIC AND NON-METALLIC ARTICLES

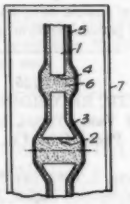
Ralph I. Conolly, Bristol, England, assignor to Rolls-Royce Limited, England

Filed Mar. 4, 1983, Ser. No. 472,032

Claims priority, application United Kingdom, Mar. 5, 1982, 8206583

Int. Cl.³ B22F 7/06, 5/04; F23C 11/00

U.S. Cl. 428—552 **20 Claims**



1. A method for manufacturing a composite component having a pre-formed body made from a base material chosen from the group consisting of a ceramic, a high temperature glass/ceramic composite and a carbon-in-carbon composite, and a metallic component bonded to a selected area on the pre-formed body, comprising the steps of:

placing the pre-formed body in a peripherally walled can, with the pre-formed body spaced throughout substantially its entire extent, from the can wall, to define a space therebetween;

filling the space between the pre-formed body and the can wall with a powdered metal, thereby completely surrounding the pre-formed body with the powdered metal;

sealing and evacuating the can;

applying hot isostatic pressure to the can to compact and sinter the metal powder and to bond the metal powder to the pre-formed body;

removing the can from the exterior of the completely coated body; and

removing the bonded metal powder from selected areas on the surface of the pre-formed body to expose areas of the base material and to leave the bonded metal powder at other areas, whereby the composite component can be directly connected to another metal component through a portion of the bonded metal powder.

11. The method of claim 1, wherein the composite component comprises an integral hub portion and blade portion for a turbine wheel, whereby the method further comprises manufacturing a plurality of integral hub portions and blade portions and after removing the bonded metal powder from selected areas on the surface of the integral hub and blade portions, said other areas of the bonded metal powder are mechanically fixed to said another metal component to form a turbine wheel.

12. The method of claim 1, wherein the composite component comprises an integral blade portion and root portion for a rotor turbine, whereby the method further comprises manufacturing a plurality of integral blade and root portions and after removing the bonded metal powder from selected areas on the surface of the individual blade and root portions, said other areas of the bonded metal powder are mechanically fixed to said another metal component to form a rotor turbine.

13. The method of claim 1, wherein the composite component comprises a flame tube, whereby said other areas of the bonded metal powder comprise supporting ribs which effectively strengthen the pre-formed body portion.

4,492,738

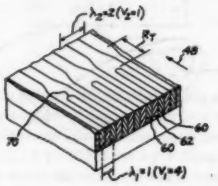
DIFFRACTION GRATING WIRE ARRAYS IN SERIES

Harvey E. Cline, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 320,995, Nov. 13, 1981,. This application Dec. 5, 1983, Ser. No. 558,124

Int. Cl.³ C22B 9/00, 61/00

U.S. Cl. 428—611 **4 Claims**



1. A diffraction grating situate on a substrate comprising a plurality of eutectic fine wire arrays in series, said grating comprising:

(1) a first region of substantially mutually parallel wires situated on said substrate, said wires of said first region having a composition substantially corresponding to at least one phase of a eutectic alloy system, a first interwire spacing and a first width measured along a plane parallel to the plane of said substrate;

(2) at least a second region of substantially mutually parallel wires situated on said substrate, said wires of said second region having the same composition as the wires of said first region, a second interwire spacing and a second width measured along a plane parallel to the plane of said substrate; and

(3) a transition region between said first and second regions, at least some of said wires of said second region being contiguous with at least some of said wires of said first region across said transition region.

4,492,739

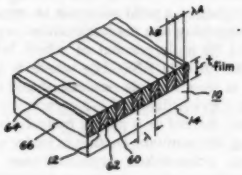
EUTECTIC FINE WIRE ARRAYS

Harvey E. Cline, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 320,995, Nov. 13, 1981,. This application Dec. 5, 1983, Ser. No. 558,125

Int. Cl.³ C22B 9/00, 61/00

U.S. Cl. 428—611 **7 Claims**



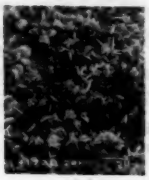
1. A eutectic fine wire array comprising a plurality of substantially mutually parallel wires situated on a substrate, said wires having a composition substantially corresponding to at least one phase of a eutectic alloy system, an interwire spacing λ_{Iws} and width W measured along a plane parallel to the plane of said substrate.

4,492,740

SUPPORT FOR LITHOGRAPHIC PRINTING PLATE

Takeshi Yamamoto; Norihito Suzaki; Toru Aoki, and Akio Iwaki, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 10, 1983, Ser. No. 503,186
Claims priority, application Japan, Jun. 18, 1982, 57-105724
Int. Cl.[3] C25D *3/04*
U.S. Cl. 428—629 9 Claims



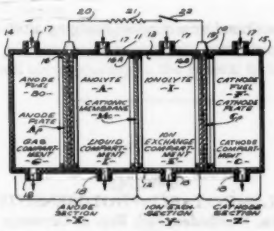
1. A support for lithographic printing plate having an electrodeposited chromium layer on an iron material, characterized in that the surface of said electrodeposited layer has a shape in which crystalline products with angles protrude thereon, the elemental composition in the surface side portion of said electrodeposited layer consists substantially of chromium and oxygen and the ratio of the atomic concentration of chromium and oxygen at said portion is substantially even at the same depth from every point on said surface.

4,492,741

BORON MONOXIDE-HYDROGEN PEROXIDE FUEL CELL

Ralph C. Struthers, 39503 Calle El Fuente, Saugus, Calif. 91350

Filed Dec. 20, 1983, Ser. No. 563,464
Int. Cl.[3] H01M *8/22*
U.S. Cl. 429—34 17 Claims



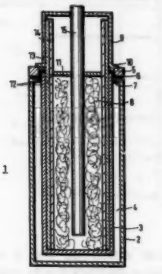
1. A boron monoxide fueled primary fuel cell comprising an elongate case structure having a central ion exchange section defining an ion exchange compartment with opposite ends and containing a fluid ionolyte, an anode section at one end of the case defining a gas compartment containing fluid boron monoxide gas, a liquid compartment between the gas compartment and one end of the ion exchange compartment and containing a fluid anolyte, a cationic membrane is disposed between and separates the anolyte and ionolyte, an anode plate is disposed between and separates the boron monoxide gas and the anolyte, said anode plate includes an electron collector part which is substantially coextensive with the interface between the boron monoxide gas and the anolyte and is connected with a terminal which connects with a related external electric circuit, a catalyst material carried by the collector part and a gas permeable hydrophobic membrane at the interface between and separating the boron monoxide and the catalyst material, a cathode section at the other end of the case defining a cathode fuel compartment adjacent the other end of the ion exchange compartment and containing a fluid cathode fuel and a cathode plate is disposed between and separates the ionolyte and the cathode fuel, said cathode plate includes an electron distributor part substantially coextensive with the interface between the ionolyte and cathode fuel and is connected with a terminal connected with said external circuit and a catalyst material carried by the distributor part.

4,492,742

ELECTROCHEMICAL STORAGE CELL

Fritz Haberfellner, Heidelberg; Stefan Mennicke, Leimen-Gauangelloch, and Gerd Prappacher, Schwetzingen, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 431,371, Sep. 30, 1982, abandoned. This application Apr. 2, 1984, Ser. No. 595,644
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1981, 3145112
Int. Cl.[3] H01M *10/39*
U.S. Cl. 429—104 8 Claims



1. Electrochemical storage cell based on sodium and sulfur comprising at least one anode space for the sodium anolyte and a cathode space for the sulfur catholyte with the anode and the cathode spaces separated from each other by a sodium ion-conducting solid electrolyte which permit sodium ions during the charge of the cell to migrate from the anode space to the cathode space and chemically react to form sodium polysulfide and the reverse reaction during the charge of the cell, said cathode space filled with sulfur catholyte to an extent that the addition of sodium ions during the discharge of the cell causes a rising pressure in the cathode space and the loss of sodium ions during the charge of the cell causes a decreasing pressure in the cathode space, at least one of said spaces bounded at least in some areas by a metallic housing, at least one supply container for the sodium polysulfide formed in the chemical reaction in which the only communication with the cathode space is at least one porous mat of ceramic showing wick action for transfer of said sodium polysulfide into the supply container by rising pressure caused by the sodium ions coming in the cathode space during discharge of the cell and for transfer of the sodium polysulfide back into the cathode space by decreasing pressure during the charge of the cell.

4,492,743

MULTILAYER PHOTOELECTRODES AND PHOTOVOLTAIC CELLS

Arthur T. Howe, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 434,603, Oct. 15, 1982,. This application Apr. 29, 1983, Ser. No. 489,815
Int. Cl.[3] H01M *6/36;* H01L *31/04*
U.S. Cl. 429—111 24 Claims

1. A multilayer structure which is suitable for use as either a photovoltaic cell or a photoelectrode in a photoelectrochemical cell which comprises an n-type semiconductor layer, a layer of insulator material which is in direct contact with said

semiconductor layer, and a layer of conducting material which is in direct contact with said layer of insulator material, wherein said insulator material is negatively charged as a consequence of the presence of aliovalent dopant ions and has a thickness which is effective to permit electron tunneling between said semiconductor and conducting material layers.

4,492,744

SECONDARY ZINC ELECTRODE FOR A SECONDARY ELECTRO-CHEMICAL CELL

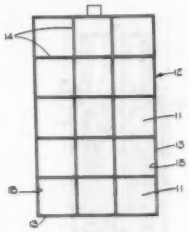
David J. Brown, Solihull; Trevor L. Markin, Reading, and Ronald M. Dell, Abingdon, all of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Mar. 28, 1983, Ser. No. 479,802

Claims priority, application United Kingdom, Apr. 6, 1982, 8210161

Int. Cl.³ H01M 4/76

U.S. Cl. 429—217 **9 Claims**



1. A secondary zinc electrode for a secondary electrochemical cell, comprising an electrically conductive support, a pressed active zinc material containing an organic binder adhering to at least one major surface of the support and presenting an outer face which is spaced outwardly of said major surface, and an electrically non-conducting grid structure separating the active material on the support into a plurality of physically separate areas.

4,492,745

PHOTOSENSITIVE MEMBER FOR ELECTROPHOTOGRAPHY WITH MIRROR FINISHED SUPPORT

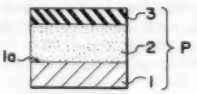
Yoshiyuki Minsura; Takao Okada, and Akitoshi Toda, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1983, Ser. No. 546,953

Claims priority, application Japan, Nov. 24, 1982, 57-205868

Int. Cl.³ G03G 5/04, 5/00

U.S. Cl. 430—67 **2 Claims**



1. a photosensitive member for electrophotography for use in a process of forming an electrostatic latent image by sequential steps of a primary corona charging concurrent with imagewise exposure, a secondary corona charging and a flush irradiation; comprising:

a conductive support having its surface treated to a mirror finish, the surface roughness of said surface being no greater than 0.1 S;

a photoconductive layer laminated on the surface of the conductive support; and

a transparent insulating layer laminated on the photoconductive layer.

4,492,746

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL WITH POLYESTER BINDER

Nobuhiro Miyakawa, Abiko; Teruaki Higashiguti, Tokyo; Yumiko Sano, Ibaragi, and Masatomi Funato, Sakai, all of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

Filed Jul. 30, 1982, Ser. No. 403,855

Claims priority, application Japan, Aug. 4, 1981, 56-121440

Int. Cl.³ G03G 5/07

U.S. Cl. 430—71 **5 Claims**

1. A photosensitive material for electrophotography comprising an organic polymeric photoconductive material selected from the group consisting of poly-N-vinyl carbazole and its nuclear substitutions, polyvinyl anthracene, polyvinylpyrene and polyacenaphthylene and a thermoplastic polyester composed mainly of recurring units represented by the general formula

$$+C-R^1-C-O-R^2-O+$$
$$\quad\quad\quad

4,492,748

LIGHT-SENSITIVE POLYCONDENSATION PRODUCT CONTAINING DIAZONIUM AND DIALDEHYDE GROUPS, AND LIGHT-SENSITIVE RECORDING MATERIAL PREPARED THEREWITH

Walter Lutz, Eleonorenstrasse 130, 6503 Mainz-Kastel; Hartmut Steppan, Panoramastrasse 17, 6200 Wiesbaden, and Fritz Erdmann, Hermann-Hesse-Strasse 38, 6500 Mainz, all of Fed. Rep. of Germany

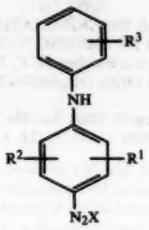
Filed Sep. 8, 1982, Ser. No. 415,927

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 3135804

Int. Cl.³ G03C 1/54; C07C 113/04

U.S. Cl. 430—175 10 Claims

1. a light-sensitive diazonium group-containing polycondensation product of a diazonium salt corresponding to the general formula



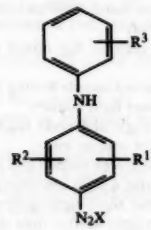
wherein

R^1, R^2, and R^3 denote hydrogen atoms, halogen atoms, alkyl groups having 1 to 3 carbon atoms, or alkoxy groups having 1 to 6 carbon atoms, and

X denotes the anion of the diazonium salt,

and an aldehyde selected from the group consisting of aromatic dialdehydes, acetals of dialdehyde hydrates, and esters of dialdehyde hydrates.

8. A process for preparing a light-sensitive diazonium group-containing polycondensation product comprising reacting a diazonium salt corresponding to the general formula:



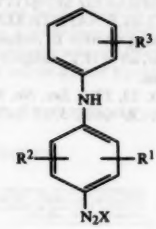
wherein

R^1, R^2, and R^3 denote hydrogen atoms, halogen atoms, alkyl groups having 1 to 3 carbon atoms or alkoxy groups having 1 to 6 carbon atoms, and

X denotes the anion of the diazonium salt

and aldehyde selected from the group consisting of aromatic dialdehydes, acetals of dialdehyde hydrates and esters of dialdehyde hydrates in a strongly acid medium.

10. A light-sensitive recording material comprising a layer support and a light-sensitive layer containing as the light-sensitive compound, a diazonium group-containing polycondensation product of a diazonium salt corresponding to the general formula



wherein

R^1, R^2 and R^3 denote hydrogen atoms, halogen atoms, alkyl groups having 1 to 3 carbon atoms or alkoxy groups having 1 to 6 carbon atoms, and

X denotes the anion of the diazonium salt,

and an aldehyde selected from the group consisting of aromatic dialdehydes, acetals of dialdehyde hydrates, and esters of dialdehyde hydrates.

4,492,749

DIAZOTYPE MATERIALS WITH 2-HYDROXY-NAPHTHALENE HAVING SULFONAMIDE SUBSTITUENT AS COUPLER

Siegfried Scheler, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 115,401, Jan. 25, 1980, abandoned. This application Sep. 15, 1983, Ser. No. 532,302

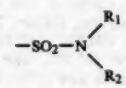
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1979, 2903342

Int. Cl.³ G03C 1/58

U.S. Cl. 430—180 3 Claims

1. A diazotype material having at least one diazo compound in a light-sensitive acid stabilized layer, which comprises, as a coupling component, at least one 2-hydroxy-naphthalene of the general formula

wherein A in the 6- or 7-position is



R_1 is hydrogen,

R_2 is an aryl group substituted by halogen alkyl or halogen, or

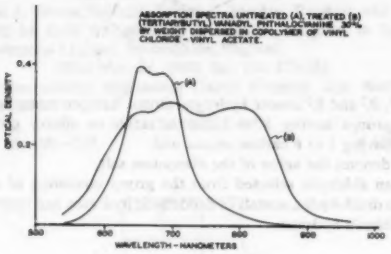
R_1 and R_2 are, conjointly with the nitrogen atom to which they are attached, pyrrolidine, piperidine, piperazine, morpholine, thiomorpholine, or hexamethyleneimine.

4,492,750

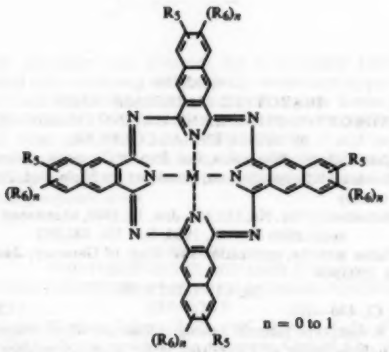
ABLATIVE INFRARED SENSITIVE DEVICES CONTAINING SOLUBLE NAPHTHALOCYANINE DYES

Kock-Yee Law, Fairport; Gordon E. Johnson, and John W. P. Lin, both of Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 13, 1983, Ser. No. 541,592
Int. Cl.³ G03C *5/04, 1/76*
U.S. Cl. 430—494 **16 Claims**


ABSORPTION SPECTRA UNTREATED (A), TREATED (B) (TERTIARYBUTYL) VANADYL PHTHALOCYANINE 30% BY WEIGHT DISPERSED IN COPOLYMER OF VINYL CHLORIDE - VINYL ACETATE.
OPTICAL DENSITY
0.4
0.2
(A)
(B)
WAVELENGTH - NANOMETERS

1. An ablative infrared-sensitive optical recording composition containing as a component thereof a dispersion of a resinous binder and a vapor treated organic solvent soluble naphthalocyanine infrared absorbing additive of the following formula:



wherein R_5 and R_6 are alkyl groups of from 4 carbon atoms to 8 carbon atoms, M is a divalent metal complex, and n is a number of from 0 to 1, wherein said vapor treated organic solvent soluble naphthalocyanine infrared absorbing additive is of a diameter of from 0.005 microns to 0.1 microns.

4,492,751

HETEROGENOUS SPECIFIC BINDING ASSAY EMPLOYING AN ENZYME SUBSTRATE AS LABEL

Robert C. Boguslaski, Elkhart; Robert J. Carrico, Bremen, both of Ind., and James E. Christner, Ann Arbor, Mich., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 894,838, Apr. 10, 1978, which is a continuation of Ser. No. 667,982, Mar. 18, 1976, abandoned, which is a continuation-in-part of Ser. No. 572,008, Apr. 28, 1975, abandoned. This application Oct. 15, 1979, Ser. No. 84,867
Int. Cl.³ G01N *33/54, 33/58, 33/52*
U.S. Cl. 435—7 **18 Claims**

1. In a heterogeneous specific binding assay method for determining a ligand in a liquid medium, which method comprises the steps of:

(a) contacting said liquid medium with reagent means including a labeled conjugate comprising a specific binding substance coupled to a labeling substance, said reagent means and the ligand forming a binding reaction system producing

(1) a bound-phase of the labeled conjugate in which the specific binding substance therein is bound by a specific binding partner thereto and

(2) a free-phase of the labeled conjugate in which the specific binding substance therein is not bound by a specific binding partner thereto,

(b) separating said bound-phase and said free-phase; and

(c) determining said labeling substance in said bound-phase or said free-phase as a function of the amount of said ligand in said liquid medium;

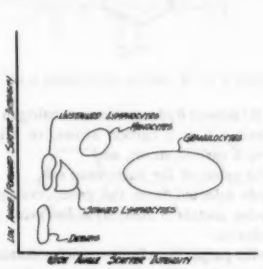
the improvement wherein said labeling substance is a substrate for an enzyme, said labeled conjugate being capable of being acted on by said single enzyme to yield directly a detectable product.

4,492,752

METHOD FOR DISCRIMINATING BETWEEN UNSTAINED AND ABSORBING DYE STAINED CELLS

Robert A. Hoffman, and Stephen H. C. Ip, both of Mansfield, Mass., assignors to Ortho Diagnostics Systems Inc., Raritan, N.J.

Filed Sep. 3, 1982, Ser. No. 414,683
Int. Cl.³ G01N *33/50, 33/52, 33/54, 21/47*
U.S. Cl. 435—7 **3 Claims**



1. A method for discriminating, in a mixed cell sample, between unstained cells and cells stained with a cell surface or cytoplasmic stain using low angle and wide angle light scatter measurements in light based flow cytometry instrumentation comprising the steps of:

(a) staining some cells in the mixed sample with a light absorbing stain;

(b) providing the mixed sample having stained and unstained cells past a focused light source;

(c) detecting low angle and wide angle light scatter as the cells pass the light source; and

(d) discriminating between stained and unstained cells on the basis that cells with a light absorbing stain produce comparatively less low angle light scatter and comparatively more wide angle light scatter than do unstained cells.

4,492,753

METHOD AND MEANS FOR ASSESSMENT AND PREDICTION OF RISK OF SUBSEQUENT ISCHEMIC CARDIAC EVENTS

William E. Shell, Los Angeles; Michael H. Burnam, Hidden Hills, and Zoltan A. Tokes, Los Angeles, all of Calif., assignors to Immudx, Inc., San Diego, Calif.

Filed Oct. 6, 1982, Ser. No. 433,153
Int. Cl.³ C12Q *1/50;* G01N *33/68*
U.S. Cl. 435—17 **16 Claims**

1. A method for assessing a cardiac patient's risk for future ischemic heart events comprising the steps of:

(a) monitoring the level of alpha-1-acid glycoprotein in a

cardiac patient's plasma or serum following an ischemic heart event;

(b) comparing the levels of alpha-1-acid glycoprotein measured in step (a) to a threshold level for alpha-1-acid glycoprotein; and

(c) determining whether said cardiac patient has a low risk of experiencing future ischemic heart events.

7. A method for assessing a cardiac patient's risk for future ischemic heart events comprising the steps of:

(a) monitoring the level of alpha-1-acid glycoprotein in a cardiac patient's plasma or serum following an ischemic heart event;

(b) monitoring the level of CK-MB in a cardiac patient's plasma or serum following said ischemic heart event;

(c) comparing the levels of alpha-1-acid glycoprotein measured in step (a) to a threshold level for alpha-1-acid glycoprotein;

(d) comparing the levels of CK-MB measured in step (b) to a threshold level for CK-MB; and

(e) determining whether said cardiac patient is a high, intermediate or low risk candidate for future ischemic heart events.

4,492,754

COMPOSITION AND METHOD FOR THE DETERMINATION OF HYDROGEN PEROXIDE

Ulrich Träger, Limburgerhof; Bernward Sojka, Viernheim, and Hans Lange, Lampertheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Jun. 11, 1982, Ser. No. 387,392

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1981, 3124594

Int. Cl.³ G01N *33/52, 33/66, 33/70, 33/92*

U.S. Cl. 435—28 **17 Claims**

1. Composition for the detection of

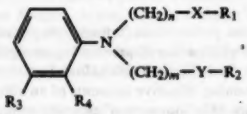
(a) hydrogen peroxide or hydrogen peroxide forming substrates, or

(b) peroxidases or peroxidatively reacting substances, which composition comprises a substrate capable of coupling 2-hydrazono-2,3-dihydro-3-methylbenzthiazole-6-sulfonic acid (S-MBTH), S-MBTH, and

(a) a peroxidase or

(b) hydrogen peroxide and hydrogen peroxide forming substance,

wherein the substrate capable of coupling is a compound of the formula



(I)

in which

n and m are individually selected from whole numbers of 1 to 4,

X and Y, which can be the same or different, represent a valence bond or a phenylene radical,

R_1 and R_2 are individually selected from carboxyl or sulfonic acid groups and one of R_1 and R_2 can also be hydrogen or lower alkyl,

R_3 is alkyl or up to 6 carbon atoms; and

R_4 is hydrogen;

or a salt of such compound.

4,492,755

PROCESS FOR ISOMERIZING L-MANNOSE TO L-FRUCTOSE

Robert O. Horwath, Westport, and William J. Colonna, Wilton, both of Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 30, 1982, Ser. No. 393,844

Int. Cl.³ C12P *19/24*; C12N *15/00, 9/90*; C12R *1/19, 1/22, 1/25*

U.S. Cl. 435—94 **6 Claims**

1. A process for isomerizing L-mannose to L-fructose which comprises contacting L-mannose with L-mannose isomerase produced by a mutant microorganism selected from the group consisting of the genera Escherichia, Lactobacillus, and Klebsiella cultivated in the absence of an inducing sugar.

4,492,756

MICROORGANISMS OF THE GENUS HYPHOMICROBIUM AND PROCESS FOR DEGRADING COMPOUNDS WICH CONTAIN METHYL GROUPS IN AQUEOUS SOLUTIONS

Oreste Ghisalba, Basel; Franz Heinzer, Porrentruy, and Martin Küenzi, Muttenz, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 1, 1982, Ser. No. 445,783

Claims priority, application Switzerland, Dec. 11, 1981, 7932/81

Int. Cl.³ C12N *1/20, 1/32*; C07 *00/00*; C12R *1/01*

U.S. Cl. 435—253 **7 Claims**

1. A biologically pure culture of microorganisms of the genus Hyphomicrobium selected from the group of the following strains:

Hyphomicrobium NRRL-B-12573,
Hyphomicrobium NRRL-B-12572,
Hyphomicrobium NRRL-B-12571,
Hyphomicrobium NRRL-B-12570,
Hyphomicrobium NRLL-B-12569,

and mutants thereof.

2. A process for the microbiological purification of aqueous solutions by degradation of lower alkanols, lower alkanoates, monosaccharides, disacchardies, dimethyl phosphite, trimethyl phosphite, lower alkylammonium compounds or free amines thereof, or of methylsulfate compounds or mixtures thereof, which process comprises culturing in such aqueous solution a microorganism of the genus Hyphomicrobium according to claim 1 or a mutant derived from said microorganism suitable for the process, in the presence of nutrient inorganic salts and optionally of a nitrogen source, in the temperature range from about 20° to 40° C. and in a pH range from about 4 to 7.5, and, if desired, isolating the biomass obtained.

4,492,757

PROCESS FOR PREPARING L-THREONINE

Masaaki Kato; Teruzo Miyoshi; Iwao Kibayashi, all of Machida; Masahisa Ikemi, Tokyo; Haruo Gomi, Machida; Yoshiaki Ishimatsu, Zama; Noriaki Koizumi, Ibaraki, and Hideaki Yamada, Kyoto, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1982, Ser. No. 449,216

Claims priority, application Japan, Dec. 28, 1981, 56-209984; Dec. 28, 1981, 56-209985

Int. Cl.³ C07B 19/02; C12P 13/08

U.S. Cl. 435—280 9 Claims

1. A process for preparing L-threonine which comprises causing D-threonine-aldolase, or D-threonine-aldolase and L-allothreonine-aldolase to act on a solution containing at least DL-threonine.

4,492,758

HYBRID VECTOR AND PROCESS FOR IMPROVING THE AMPLIFICATION AND EXPRESSION OF HYBRID VECTORS BY THE USE OF MITOCHONDRIAL DNA

Karl Esser; Ulf Stahl, both of Bochum; Paul Tudzynski, Gladbeck, and Ulrich Kück, Bochum, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 383,205

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1981, 3121815

Int. Cl.³ C12N 1/00, 1/20, 5/00, 5/02, 1/14; C12P 21/00, 19/34, 15/00

U.S. Cl. 435—317 3 Claims

1. A hybrid vector synthesized from a fragment of mitochondrial DNA, containing a mitochondrial DNA origin of replication, of Acremonium or Podospora species.

4,492,759

FIELD-TEST METHOD AND APPARATUS FOR THE DETECTION OF ASBESTOS

Esther M. Gorman, and William W. Gorman, Jr., both of St. Petersburg Beach, Fla., assignors to E-C Apparatus Corporation, St. Petersburg, Fla.

Filed Dec. 28, 1981, Ser. No. 334,591

Int. Cl.³ G01N 31/22

U.S. Cl. 436—72 6 Claims

1. Step-by-step method for conducting field-tests for the possible presence of asbestos comprising the following sequentially performed steps:

(a) placing a sample to be tested in an open column having removable top and bottom caps and a filter material resistant to phosphoric acid and sulfuric acid, the filter material being lodged inside the column, at one end;

(b) preparing the sample in the same column for testing by washing said sample in the same column to remove waste;

(c) draining the wash water and waste from the same column through said filter material leaving a residue to be tested on said filter material;

(d) placing said bottom cap on said column;

(e) reacting the residue on said filter material with an acid reagent for releasing magnesium or iron, by contacting the residue on said filter material with said acid reagent in the same column and with said bottom cap in place on said column; and

(f) adding a color indicating reagent to the residue on said filter material and in the same column to detect the presence of magnesium or iron.

4,492,760

HLA D TYPING ASSAY

Elaine C. DeFreitas, Villanova, Pa., assignor to The Wistar Institute of Anatomy and Biology, Philadelphia, Pa.

Filed Apr. 19, 1983, Ser. No. 486,441

Int. Cl.³ G01N 33/50; C12N 15/00

U.S. Cl. 436—503 36 Claims

1. A method of determining the HLA D type of human monocytes comprising:

(a) pulsing human monocytes with a particular antigen;

(b) contacting said pulsed monocyte with at least one screening cell culture selected from the group consisting of antigen-specific T lymphocytes and antigen-specific T cell hybridomas, the cells in each said screening cell culture being substantially of a single HLA D binding type and specific for said particular antigen; and

(c) determining whether said pulsed monocytes selectively bind to said screening cells.

4,492,761

COMPLEMENT ASSAY METHOD

David T. Durack, Durham, N.C., assignor to Duke University, Durham, N.C.

Filed Apr. 5, 1982, Ser. No. 365,334

Int. Cl.³ C12Q 1/18, 1/34; C12N 1/06, 1/20

U.S. Cl. 436—519 16 Claims

2. A method of determining the activity of complement in a sample, which comprises:

(a) incubating a mixture comprising (1) an aqueous suspension of *E. coli* ATCC 39056 bacteria at a concentration of from 10^5 to 10^9 cells/ml, said cells containing an assayable intracellular component, and (2) said sample, wherein said mixture contains from 0.2 to 50% by volume of said sample and said incubating is conducted at a temperature of at least 4° C. but less than 50° C., at a pH of from 7.0 to 7.9 and at an ionic strength of from 0.027 to 0.20 for a time sufficient to allow 100% lysis of said bacteria in a mixture containing 12% of a normal human serum standard under the same conditions of temperature, ionic strength, and pH at which said mixture is incubated; and

(b) detecting said assayable component released into solution during said incubating.

4,492,762

FLUORESCENT POLARIZATION IMMUNOASSAYS

Chao-Huei J. Wang, Gurnee; Stephen D. Stroupe, Libertyville, and Michael E. Jolley, Round Lake, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 329,974, Dec. 11, 1981, which is a continuation-in-part of Ser. No. 235,259, Feb. 17, 1981, abandoned, Ser. No. 329,975, Dec. 11, 1981, and Ser. No. 325,872, Nov. 30, 1981, Pat. No. 4,420,568, said Ser. No. 325,872, is a continuation of Ser. No. 173,553, Jul. 30, 1980, abandoned. This application Jun. 30, 1982, Ser. No. 393,577

Int. Cl.³ G01N 33/54

U.S. Cl. 436—537 4 Claims

1. In a fluorescent polarization immunoassay for a substance in blood serum or plasma the improvement comprising:

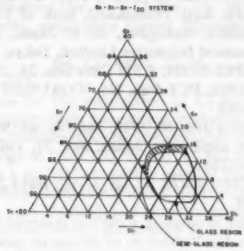
conducting the fluorescent polarization immunoassay in a solution containing effective amounts of an anionic surfactant to disrupt bilirubin serum albumin complex in the sample and thereby reduce background fluorescence of the blood serum or plasma sample.

4,492,763

LOW DISPERSION INFRARED GLASS

Patrick A. Trotta, Plano, and Paul A. Zak, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 6, 1982, Ser. No. 395,774
Int. Cl.³ C03C 3/12, 3/30
U.S. Cl. 501—40 7 Claims



1. A glass consisting of:
from 6–30% atomic of bromine;
selenium in a quantity such that the total concentration of bromine plus selenium comprises between 55% and 90% atomic of the total;
from 2–22% atomic of gallium; and
from 4–30% atomic of antimony.

4,492,764

SINTERED CERAMIC BODY CONTAINING TITANIUM CARBONITRIDE

Tadahiko Watanabe, Saga; Yuko Tsuya, Tokyo, and Yuji Enomoto, Sakura, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 16, 1983, Ser. No. 475,976
Claims priority, application Japan, Jul. 12, 1982, 57-121748
Int. Cl.³ C04B 35/56, 35/58
U.S. Cl. 501—87 16 Claims

1. A titanium carbonitride-based ceramic body prepared by sintering a powdery mixture consisting essentially of
(a) from 5 to 95% by weight of a titanium carbonitride,
(b) from 95 to 5% by weight of at least one metal boride selected from the group consisting of titanium diboride TiB_2, chromium diboride CrB_2, tantalum diboride TaB_2, manganese diboride MnB_2, molybdenum diboride MoB_2, vanadium diboride VB_2, niobium diboride NbB_2, hafnium diboride HfB_2, aluminum diboride AlB_2 and zirconium diboride ZrB_2, tungsten boride W_2B_5 and molybdenum boride Mo_2B_5,
(c) from 0 to 10% by weight elementary boron, and
(d) from 0 to 50% by weight of titanium carbide or titanium nitride.

4,492,765

Si_3N_4 CERAMIC ARTICLES HAVING LOWER DENSITY OUTER LAYER, AND METHOD

Sergej-Tomislav Buljan, Acton, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Aug. 15, 1980, Ser. No. 178,485
Int. Cl.³ C04B 35/58
U.S. Cl. 501—97 2 Claims

1. A dense monolithic Si_3N_4 ceramic body, characterized in that at least a portion of the body has an outer layer exhibiting a lower density than the interior of the body.

4,492,766

SPRAY-COATING MATERIAL

Karel Zverina, and Petr Kroupa, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Jun. 3, 1983, Ser. No. 500,616
Claims priority, application Czechoslovakia, Jun. 11, 1982, 4350-82
Int. Cl.³ C04B 35/08, 35/48
U.S. Cl. 501—104 5 Claims

1. Spray-coating material consisting essentially of an admixture of the following metal oxides which admixture consists of 8–35 wt. % of a metal oxide selected from the group consisting of magnesium oxide MgO and calcium oxide CaO, 2–10 wt. % of beryllium oxide BeO, and 55–90 wt. % of a metal oxide selected from the group consisting of aluminum oxide Al_2O_3, zirconium dioxide ZrO_2, silicon dioxide SiO_2, chromic oxide Cr_2O_3, and titanium dioxide TiO_2 alone or in admixture.

4,492,767

LOW TEMPERATURE DECOKING PROCESS FOR REACTIVATING IRIDIUM AND SELENIUM CONTAINING CATALYSTS

Shun C. Fung, Bridgewater, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 375,230, May 5, 1982,. This application Nov. 2, 1983, Ser. No. 548,218
Claims priority, application Japan, May 4, 1983, 58-78847
Int. Cl.³ B01J 27/30, 23/96, 27/02; C10G 35/085
U.S. Cl. 502—35 14 Claims

1. A process for reactivating an agglomerated, coked, iridium and selenium containing catalyst comprising the steps of:
(a) partially decoking said selenium containing catalyst in an oxygen-containing atmosphere at a temperature below about 430° C. for a sufficient time so that the remaining catalyst coke level is less than 1 weight percent and the iridium agglomeration on said catalyst is less than about 50 percent;
(b) reducing said catalyst from step (a) by contact with a reducing atmosphere at elevated temperature for a sufficient time to substantially convert said iridium to metallic iridium;
(c) pretreating said catalyst from step (b) by contact with an elemental oxygen-free atmosphere comprising a halide-providing compound at elevated temperature for a sufficient time to provide the catalyst with about 1.3 weight percent and above halide, taken as the coke-free, dry catalyst; and
(d) redispersing the metallic iridium from step (c) while maintaining said 1.3 weight percent halide provided to the catalyst by contacting with an atmosphere comprising elemental halogen and water vapor in a halogen/water volume ratio of about 0.2 to 5 at a temperature of about 480° C. and above, for a time sufficient to substantially complete decoking and to effect a 75–100 percent redispersion of said metallic iridium.

12. The process of claim 1 wherein the temperature in steps (b) and (c) is in the range of about 250° to 600° C.

14. A process for reactivating a coked, agglomerated platinum-iridium-selenium on alumina catalyst comprising the steps of:
(a) decoking said selenium containing catalyst in an oxygen-containing atmosphere at a temperature in the range of about 375° to 430° C., for a sufficient time so that about 0.3 to about 0.8 weight percent carbon remains on said catalyst and iridium metal agglomeration on said catalyst is less than about 50 percent;
(b) contacting said agglomerated catalyst with a hydrogen atmosphere at a temperature in the range of about 300° to 540° C. for a sufficient time to substantially reduce the oxides of platinum and iridium to the respective metals;
(c) contacting said catalyst from step (b) with an elemental oxygen-free and elemental halogen-free atmosphere com-

prising hydrogen chloride at a temperature in the range of about 300° to 540° C. for a sufficient time to saturate the catalyst with chloride; and

(d) contacting the catalyst from step (c) while maintaining a saturated catalyst chloride level with an atmosphere comprising elemental chlorine and water vapor in a chlorine/-water volume ratio of about 0.5 to 2 at a temperature in the range of about 500° to 540° C. for a sufficient time to substantially remove all coke deposits and to effect about a 90 to 100 percent redispersion of metallic platinum and iridium.

4,492,768

POLYOLEFIN POLYMERIZATION PROCESS AND CATALYST

Gil R. Hawley, Dewey, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 19, 1983, Ser. No. 524,615

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—111 **14 Claims**

1. A process for preparing an olefin polymerization catalyst comprising reacting an alkoxytitanium compound, a phenol, and a small quantity of water in a hydrocarbon liquid, then reacting the resulting solution with a magnesium dihalide having less than 1.5 moles of water per mole of magnesium dihalide to form a first catalyst component solution, then reacting that solution with an organoaluminum halide to form a solid product, and then reacting said solid product with a halogenating agent comprising a titanium halide, wherein the amount of water employed in forming said first catalyst component solution is such that the catalyst is more active than if no water were employed.

4,492,769

POLLUTION CONTROL CATALYST FOR INTERNAL COMBUSTION ENGINE EXHAUST SYSTEM/CATALYTIC CONVERTER AND PROCESS FOR ITS PREPARATION

Gilbert Blanchard, Le Plessis Belleville; Jean-Pierre Brunelle, Saint-Brice Sous Foret, and Michel Prigent, Rueil Malmaison, all of France, assignors to Pro-Catalyse, Rueil-Malmaison, France

Filed Jul. 25, 1983, Ser. No. 516,844

Claims priority, application France, Jul. 26, 1982, 82 12969

Int. Cl.³ B01J *23/58, 23/60, 23/64, 23/89*

U.S. Cl. 502—262 **17 Claims**

1. A process for the preparation of a catalyst composition adopted for the treatment of internal combustion engine exhaust gases, comprising (i) coating and/or impregnating a support with a catalyst of palladium and at least one base metal element, (ii) activating the step (i) catalyst at a temperature ranging from 120° to 800° C., (iii) next coating and/or impregnating the step (ii) activated catalyst with at least one platinum group precious metal other than palladium, or a combination of palladium and at least one other platinum group precious metal, and (iv) thence activating the step (iii) catalyst at a temperature ranging from 300° to 800° C.

4,492,770

CATALYST AND USE THEREOF IN TREATING INTERNAL COMBUSTION ENGINE EXHAUST GASES

Gilbert Blanchard, Le Plessis Belleville; Jean-Pierre Brunelle, Saint-Brice Sous Foret, and Michel Prigent, Rueil-Malmaison, all of France, assignors to Procatalyse, Rueil-Malmaison, France

Filed Dec. 11, 1981, Ser. No. 330,007

Claims priority, application France, Dec. 17, 1980, 80 26749

Int. Cl.³ B01J *23/10, 23/42, 23/44, 23/72*

U.S. Cl. 502—304 **17 Claims**

1. A catalyst useful for treating the exhaust gases of internal combustion engines comprising a support and an active phase deposited thereon, which activate phase comprises copper, either cerium or iron, at least one metal selected from the group consisting of platinum and palladium, and at least one metal selected from the group consisting of iridium and rhodium.

4,492,771

PROCESS FOR PRODUCING CARBON MATERIAL FOR DE-SULFURIZATION FROM A BINDER WITH A BLEND OF NONCOKING AND COKING COAL

Takashi Hasegawa; Koji Tsuchihashi, both of Fukuoka, and Hiroshi Yamashita, Kanagawa, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

PCT No. PCT/JP82/00024, § 371 Date Sep. 24, 1982, § 102(e) Date Sep. 24, 1982, PCT Pub. No. WO82/02537, PCT Pub. Date Aug. 5, 1982

PCT Filed Jan. 26, 1982, Ser. No. 432,958

Claims priority, application Japan, Jan. 27, 1981, 56-10688; Jan. 30, 1981, 56-12337

Int. Cl.³ C01B *31/10, 31/08, 31/02;* B01J *20/20*

U.S. Cl. 502—420 **10 Claims**

1. A process for producing a carbon material useful as an adsorbent for the desulfurization of discharge gases, comprising:

(a) mixing a binder with a coal blend of a non-coking coal and a coking coal;

(b) shaping said mixture into objects of a desired shape; and

(c) carbonizing the shaped coal product by heating the same in the presence of a combustion waste gas atmosphere containing oxygen until said shaped coal mass attains an elevated temperature of 600° to 1000° C., said process being characterized by the fact that the blended coal materials of step (a) have a mean reflecting power ($\bar{R}_o$) of 0.3 to 1.0 and by the fact that the mixture of binder with blended coal material in step (a) has the following physical properties:

(a) Gieseler maximum fluidity (GP-MF) to 0 to 3000 DDPM

(b) Crucible swelling number (CSN) of 0, ½, 1, 1½ or 2

(c) Roga-microstrength index (RI) of 10 to 95.

2. The process of claim 1 wherein, in said carbonization treatment, the increase in the temperature of the coal is initially elevated at a rate within the range of 15° to 120° C./min until the temperature of the shaped coal reaches 400° C.

7. The process of claim 1 or 2, wherein said carbonization of said shaped coal material is achieved by heating the shaped coal material in a counter-current, internal heating rotary kiln with a combustion waste gas comprised of 3 to 10% by volume oxygen and 20 to 80% by volume water vapor which is supplied to said kiln at a rate of 1 to 10 Nm^3/hr per 1 kg of shaped coal material fed into said rotary kiln, the gas phase temperature at the inlet of said rotary kiln being maintained at 450° to 750° C. and the gas phase temperature at the outlet of said rotary kiln being maintained at 700° to 1000° C.

4,492,772

PROCESS FOR THE PRODUCTION OF OXYGENATED HYDROCARBONS BY THE CATALYTIC CONVERSION OF SYNTHESIS GAS

William J. Ball, Capel; Leonard Cotton, and David G. Stewart, both of Epsom, all of England, assignors to The British Petroleum Company Limited, London, England

Filed Oct. 13, 1982, Ser. No. 434,055

Claims priority, application United Kingdom, Oct. 17, 1981, 8131380

Int. Cl.³ C07C *27/06*

U.S. Cl. 518—713 **10 Claims**

1. A process for the production of an oxygenated hydrocarbon product comprising methanol and ethanol which process comprises contacting synthesis gas at a temperature in the range 150° to 450° C. and a pressure in the range 1 to 700 bars with a catalyst comprising a mixture of the metals rhodium, silver, zirconium and molybdenum incorporated on the same support.

4,492,773

PROCESS FOR THE PRODUCTION OF C_1 TO C_4 OXYGENATED HYDROCARBONS BY THE CATALYTIC CONVERSION OF SYNTHESIS GAS

William J. Ball, Capel; Leonard Cotton, and David G. Stewart, both of Epsom, all of England, assignors to The British Petroleum Company Limited, London, England

Continuation of Ser. No. 285,409, Jul. 20, 1981, abandoned. This application Dec. 8, 1982, Ser. No. 447,783

Claims priority, application United Kingdom, Aug. 1, 1980, 8025261

Int. Cl.³ C07C 27/06

U.S. Cl. 518—713 13 Claims

1. A process for the production of C_1 to C_4 oxygenated hydrocarbon compounds comprising methanol and/or ethanol which process comprises contacting synthesis gas at a temperature in the range of from 150° to 450° C. and a pressure in the range of from 1 to 700 bars with a catalyst comprising a mixture of a rhodium component and a silver component on the same support, said rhodium and silver components under the reaction conditions being substantially in the metallic form.

4,492,774

METHOD FOR CONVERTING SYNTHESIS GAS USING AN ACTIVATED COBALT-SUBSTITUTED LAYERED ALUMINOSILICATE

Charles L. Kibby, Gibsonia, and Thaddeus P. Kobylinski, Prospect, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 27, 1982, Ser. No. 453,139

Int. Cl.³ C07C 1/04

U.S. Cl. 518—713 10 Claims

1. A method for converting synthesis gas to a product predominating in liquid hydrocarbons which comprises contacting said synthesis gas under conversion conditions with a synthesis gas conversion catalyst obtainable by the multi-stage activation of a layered aluminosilicate having cobalt incorporated into the crystal lattice and having the general formula:

$$Al_{4-s-x}Co_{(3/2)n}O_8(OH,F)_4Si_{8-y}Al_yO_{12}\cdot(3z+y)NH_4^+\cdot zH_2O$$

where n is between about 0.02 and about 4; x is up to about 1; n+x is between about 0.02 and about 4; y is between about 0.05 and about 2; and z is up to about 10; said activation procedure comprising the steps:

(a) heating the layered aluminosilicate in a reducing atmosphere at a temperature between about 500° and about 750° C. until a significant amount of the cobalt is reduced;

(b) heating the reduced aluminosilicate in an oxidizing atmosphere at a temperature between about 100° and about 600° C. until a significant amount of the cobalt is oxidized, and

(c) heating the oxidized aluminosilicate in a reducing atmosphere at a temperature between about 200° and about 500° C. until a signficant quantity of the cobalt is reduced.

4,492,775

ORGANOPOLYSILOXANE FOAM COMPOSITION

Taro Koshii, Chiba, and Mitsugu Yamashita, Ichihara, both of Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed May 22, 1984, Ser. No. 612,773

Claims priority, application Japan, Jun. 7, 1983, 58-101150

Int. Cl.³ C08J 9/02

U.S. Cl. 521—77 11 Claims

1. A foamable polyorganosiloxane composition comprising the product obtained by mixing together:

(A) 50–100 parts by weight of a polyorganosiloxane substantially free of silicon bonded hydroxyl groups, containing at least 2 silicon-bonded hydroxyl groups per molecule, no aliphatically unsaturated hydrocarbon radicals, and exhibiting a viscosity of from 1 to 1000 Pa·s at 25° C.;

(B) 0.1–50 parts by weight of a polyorganohydrogensiloxane containing at least two silicon-bonded hydrogen atoms per molecule, no aliphatically unsaturated hydrocarbon radicals, and exhibiting a viscosity of from 0.001 to 1000 Pa·s at 25° C.;

(C) a catalytic quantity of a platinum group metal or compound thereof;

(D) 0.1–10 parts by weight per 100 parts of combined weight of (A) and (B) of a material containing at least 0.5 weight % of either hydroxyl or carboxyl groups and selected from the group consisting of (a) polyorganosiloxanes exhibiting a viscosity of at most 1 Pa·s at 25° C. and represented by the average unit formula

$$R_a^1R_b^2SiO_{(4-a-b)/2}$$

where R^1 is a monovalent hydrocarbon radical; R^2 is $-R^3OH$ or $-R^3COOH$ where R^3 is a monovalent hydrocarbon radical, a is from 0 to 3, inclusive, b is greater than 0 but not more than 3, and the sum of a and b is greater than 0 but not more than 3; (b) the partial esters of saturated aliphatic divalent- and trivalent alcohols and the partial esters of polyalkylene glycols and copolymers thereof;

(E) 1–150 parts by weight per 100 parts of combined weight of (A) and (B) of an inorganic filler with a maximum mean particle size of 1 micron; and

(F) 0.001–3 parts by weight per 100 parts by weight of combined weight of (A) and (B) of a retarder for (C).

4,492,776

HYDROGEL CONTACT LENSES FOR PERMANENT WEAR

Ivor B. Atkinson, and Barry C. Holdstock, both of Surbiton, England, assignors to CooperVision, Inc., Menlo Park, Calif.

Division of Ser. No. 505,419, Jun. 16, 1983, Pat. No. 4,451,630. This application Apr. 12, 1984, Ser. No. 599,739

Claims priority, application United Kingdom, Apr. 29, 1983, 8311788

Int. Cl.³ C08J 3/00

U.S. Cl. 523—108 1 Claim

1. A contact lens comprising a polymer hydrogel having a water content of from about 55 to 85% by weight of water and containing alkali metal or alkaline earth metal carboxylate moieties, wherein said polymer is the product obtained by polymerizing, in the presence of an azo type initiator, from 30 to 50% by weight of N-vinyl pyrrolidone, up to 5% by weight of acrylic or methacrylic acid, 0.1 to 1% by weight of 1,3,5-tris(propenoxy)-2,4,6-triazine as cross-linking monomer, the balance being essentially hydroxyethyl methacrylate and subsequently swelling in aqueous medium.

4,492,777

HEAT TREATED BARIUM OR STRONTIUM GLASS

Robert K. Denton, Jr., Allentown, and Narayan G. Kumar, Freehold, both of N.J., assignors to Johnson & Johnson Dental Products Co., East Windsor, N.J.

Filed Nov. 26, 1982, Ser. No. 444,560

Int. Cl.³ C08K 3/40; C03B 32/00

U.S. Cl. 523—115 4 Claims

1. A single phase barium or strontium glass powder produced by a process that comprises subjecting acid-washed single phase barium or strontium glass powder to an elevated temperature sufficient to cause a significant reduction in the specific surface area of said glass powder, but below the sintering temperature of said glass powder, wherein said glass is hydrophobic as is evidenced by its absorbing less than 0.1 weight percent water, as determined by a differential scanning calorimeter, when exposed to normal ambient conditions.

3. A resinous dental restorative composition containing a polymerizable composition, a polymerization initiator, and the glass powder of claim 1.

4,492,778

METHOD FOR MAKING FLUORESCENT LIGHT-COLLECTORS

Uwe Claussen, Leverkusen; Josef Merten, Korschenbroich; Harry Röhr, Frechen, and Bernd Melchior, Remscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Sep. 19, 1983, Ser. No. 533,126

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1982, 3236241

Int. Cl.³ G21K *1/10*; H01L *31/04*; G21F *1/10*

U.S. Cl. 523—137 2 Claims

1. A method for making a light-collector from a transparent plastic containing a fluorescent dye, wherein the monomers forming transparent plastics are mass-prepolymerized at temperatures of from 50° to 160° C. and under pressures of from 2 to 20 bars using a radical catalyst from the group consisting of percarbonates, acyl sulfonyl peroxides, perketones, or azodiiso butyric acid esters, and the fluorescent dye is added either before, during, or at the end of prepolymerization, and the mixture is then polymerized to completion after adding another catalyst from the group consisting of percarbonates, acyl sulfonyl peroxides, perketones, azoisobutyronitrile or azoisobutyric acid esters, hydroperoxides, and perketals, also under pressures of from 2 to 20 bars and at temperatures of from 50° to 160° C.

4,492,779

ARAMID POLYMER AND POWDER FILLER REINFORCED ELASTOMERIC COMPOSITION FOR USE AS A ROCKET MOTOR INSULATION

Kenneth E. Junior, Madison, and James D. Byrd, Huntsville, both of Ala., assignors to Thiokol Corporation, Chicago, Ill.

Filed Dec. 7, 1981, Ser. No. 328,333

Int. Cl.³ C08K *3/40*, *3/36*, *3/22*

U.S. Cl. 523—138 19 Claims

1. A process for insulating a solid propellant rocket motor, comprising the step of employing an essentially asbestos-free elastomeric composition as an insulating liner, said composition comprising:

A. from 1 to 40 percent by weight of aramid polymer fibers,

B. from 1 to 75 percent by weight of a powder filler selected from the group consisting of silica, iron oxide, titanium oxide, carbon, milled glass, and ceramic clays, and

C. A vulcanizable elastomeric composition including:

(i) a vulcanizable elastomer, and

(ii) vulcanizing agents for said elastomer.

4,492,780

PROCESS FOR THE PREPARATION OF A POLYMER DISPERSION

Klaus Zimmerschied, Wiesbaden, and Helmut Rinno, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 27, 1982, Ser. No. 453,096

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1981, 3151813

Int. Cl.³ C08L *1/26*, *1/28*

U.S. Cl. 524—45 7 Claims

1. The method of making a polymer dispersion, which method comprises polymerizing:

(a) at least one ester of acrylic acid and/or methacrylic acid with an alcohol having 1 to 10 carbon atoms,

(b) 0.1 to 10 percent, by weight of all the monomers, of at least one water soluble unsaturated carboxylic acid or of one water soluble derivative of such an acid, and

(c) 0 to 30 percent, by weight of all the monomers, of at least one mono-olefinically unsaturated compound which is different from any compound in (a) or (b) above,

in an aqueous medium at a temperature from 30° C. to 100° C. in the presence of free radical-forming polymerization initiator, an emulsifier, and of a protective colloid which is water soluble carboxymethylcellulose having an average degree of substitution from 0.3 to 0.65.

4,492,781

METHOD AND COMPOSITION FOR MAINTAINING AND REPAIRING ASPHALT-AND RUBBER-CONTAINING SURFACES

Francis J. Duszak, Box 297, Landenberg, Pa. 19350; James P. Modrak, 403 Blackstone Rd., Newark, Del. 19713, and Dick Deaver, 121 Old Kennett Rd., Kennett Square, Pa. 19348

Filed May 19, 1983, Ser. No. 496,148

Int. Cl.³ C08L *93/00*

U.S. Cl. 524—59 24 Claims

1. A spreadable fiber reinforced composition comprising, in combination

(A) an emulsion comprising

(a) a base component of one or more materials of a member selected from the group consisting of an asphalt, asphalt/rubber, rubber, acrylic copolymer, and asphalt-/acrylic copolymer having a ratio by base weight of asphalt/rubber/acrylic copolymer of about 100–10-/0–90/0–70,

(b) an effective amount of emulsifying agent, and

(c) water;

(B) an active effective amount of water-soluble polymer material compatible with the emulsifying agent;

(C) 0.25 to about 10.0 weight percent reinforcing fiber component by weight of base component;

(D) about 0–1000 weight percent aggregate by weight of base component;

(E) about 0–5 weight percent of curing and thickening agent by weight of base component; and

(F) about 0–10 weight percent rosin ester material by weight of base component.

4,492,782

MOULDING COMPOUNDS BASED ON POLYESTER

Richard S. Williams, Bromsgrove, and Terry Daniels, Oldbury, both of England, assignors to BIP Chemicals Limited, Manchester, England

Filed Jul. 26, 1983, Ser. No. 517,446

Claims priority, application United Kingdom, Aug. 3, 1982, 8222385

Int. Cl.³ C08K *5/07*; C08L *67/00*, *67/04*

U.S. Cl. 524—293 19 Claims

1. A polyester moulding composition consisting essentially of polyethylene terephthalate or a polyester containing at least 80% by weight of polyethylene terephthalate repeating units, polycaprolactone and a nucleant for crystallization of the polyethylene terephthalate, the polycaprolactone having a number average molecular weight of above 20,500.

4,492,783

BINDER FOR OBTAINING A CERAMIC MOLDED GREEN BODY

Taku Tanaka; Hitoshi Maruyama, both of Kurashiki; Takuji Okaya, Nagaokakyo, and Koichi Kajitani, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Jan. 16, 1984, Ser. No. 571,373

Claims priority, application Japan, Jan. 14, 1983, 58-4472

Int. Cl.³ C08L *3/22*

U.S. Cl. 524—430 14 Claims

1. A composition for producing a ceramic molded green body which comprises 100 parts of ceramic powder and about 0.1 to about 20 parts of a binder which comprises a modified polyvinyl alcohol having either (A) a hydrophobic group having a hydrocarbyl group of four or more carbon atoms or (A) plus (B) an ionic hydrophilic group in the side chain.

4,492,784

ADHESIVE FOR BUTADIENE STYRENE COPOLYMER

Harold D. Boultinghouse, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 16, 1983, Ser. No. 523,531
Int. Cl.³ C08K 5/02
U.S. Cl. 524—473 5 Claims

1. An adhesive composition consisting essentially of:

(a) from about 10–90 weight percent of at least one solvent selected from the group consisting of perchloroethylene, 1,1 -dichloroethane and 1,1,1-trichloroethane; and

(b) from about 90–10 weight percent of a copolymer consisting of at least one vinyl arene selected from the group consisting of styrene, alpha-methyl styrene, o-, m-, or p-vinyltoluene, 2,4-dimethylstyrene, 2,4-diethylstyrene, 2-chlorostyrene, 2-chloro-5-methylstyrene, vinylnaphthalene and at least one substituted or unsubstituted alkyl acrylate, selected from the group consisting of methyl acrylate, ethyl acrylate, isopropyl acrylate, butyl acrylate, methyl methacrylate, ethyl methacrylate, butyl methacrylate, hexyl methacrylate, cyclohexyl methacrylate, and methyl ethacrylate wherein the weight ratio of vinyl arene to acrylate in the copolymer of (b) is about 5:95 to about 95:5.

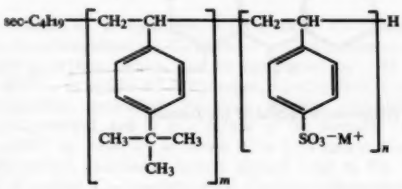
4,492,785

WATER SOLUBLE BLOCK POLYMERS

Paul L. Valint, Jr., Asbury, and Jan Bock, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 29, 1982, Ser. No. 454,243
Int. Cl.³ C08L 51/00
U.S. Cl. 524—529 8 Claims

1. A water soluble diblock polymer having the formula:



wherein m is about 0.5 to about 15.0 mole %, n is about 85.0 to about 99.5 mole %, and M is selected from the group consisting of hydrogen, and metal ions of iron, aluminum, lead, and Groups IA, IIA, IB and IIB of the Periodic Table of Elements.

4,492,786

MODIFIED ORGANOPOLYSILOXANE COMPOSITION

Edwin R. Evans, New York, and Robert F. Clark, Saratoga, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Aug. 26, 1983, Ser. No. 527,298
Int. Cl.³ C08L 83/04
U.S. Cl. 524—865 32 Claims

1. a curable fluorosilicone composition comprising:

(A) an organopolysiloxane having terminal groups selected from the class consisting of —H, —OH, —R, —OR, and —CH=CH_2, and pendant groups, bonded directly to silicon, selected from —R, —R′ and —R′—R″ groups, wherein R is a monovalent hydrocarbon radical of from 1 to 8 carbon atoms free of aliphatic unsaturation, R′ is a monovalent hydrocarbon or halo-hydrocarbon radical of from 1 to 8 carbon atoms, and R″ is a monomeric or polymeric group grafted to said R′ group and derived from an unsaturated fluorocarbon or mixture of unsaturated fluorocarbons having 2 or 3 carbon atoms and up to 6 fluorine atoms grafted to the organic radicals represented by R′, said organopolysiloxane having at least one pendant —R′—R″ group;

(B) a vinyl-functional polymeric crosslinking agent; and

(C) a free-radical initiator capable of promoting crosslinking between components (A) and (B), above.

16. A curable composition as defined in claim 1, which contains the additional component (D) of a filler selected from fumed silica, treated silica, and silica aerogel.

4,492,787

PROCESS FOR CONTINUOUSLY PRODUCING PROPYLENE-ETHYLENE BLOCK COPOLYMER

Ryokichi Takashima; Nobuaki Goko; Yumito Uehara; Yasuhiro Nishihara, and Hidetoshi Yamamoto, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Aug. 30, 1982, Ser. No. 413,159
Claims priority, application Japan, Sep. 18, 1981, 56-147581; Oct. 22, 1981, 56-169007
Int. Cl.³ C08G 297/08
U.S. Cl. 525—53 7 Claims

1. In a process for producing a propylene-ethylene block copolymer by a continuous multi-stage polymerization comprising a first stage in which propylene is polymerized in a first polymerization vessel in the presence of a propylene polymerization catalyst, and a second stage in which propylene and ethylene are copolymerized in a second polymerization vessel, wherein:

the polypropylene slurry discharged from the first polymerization vessel is supplied to a concentrator to separate said slurry into a concentrated polypropylene slurry and a supernatant liquid;

the concentrated polypropylene slurry is then introduced through an upper part of a hydraulic sedimentation classifier to be countercurrently contacted with the upward flowing supernatant fluid introduced through a lower part of said classifier to obtain hydraulically sedimented polypropylene and not hydraulically sedimented polypropylene;

the thus obtained hydraulically-sedimented polypropylene is then supplied to the second polymerization vessel or to a further propylene polymerization vessel; and

the not hydraulically sedimented polypropylene is then recycled from the classifier to the first polymerization vessel.

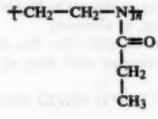
4,492,788

PARTIALLY DEACYLATED ULTRA-HIGH MOLECULAR WEIGHT POLY(N-PROPIONYLETHYLENIMINES)

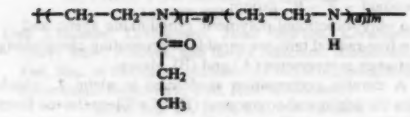
Robert S. Cooke, Morris Plains, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 3, 1983, Ser. No. 455,093
Int. Cl.³ C08G 73/00
U.S. Cl. 525—410 9 Claims

1. A partially deacylated polymer produced via deacylation of a polymer having a polymeric structure consisting essentially of repeat units having the structure



wherein said partially deacylated polymer is represented by the structure



wherein m is between about 5,000 and about 200,000; wherein n is between about 10,000 and about 200,000 and wherein d represents the degree of deacylation and is between 0.1 and 0.9.

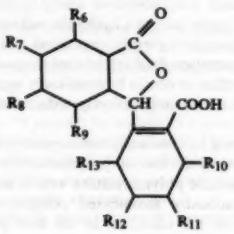
4,492,789

EPOXY RESIN COMPOSITION

Kazuhide Nakashima, Ichihara; Takayuki Saito, Hitachi; Takeshi Nakahara, Chiba, and Shigeo Tanaka, Ichihara, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 392,249, Jun. 25, 1982, abandoned.
This application Apr. 1, 1983, Ser. No. 481,359
Claims priority, application Japan, Jun. 30, 1981, 56-102964
Int. Cl.³ C08G 59/16
U.S. Cl. 525—531 **11 Claims**

1. An epoxy resin composition comprising
(a) an epoxy resin, and
(b) a lactone represented by the formula:



wherein the group represented by R_6, R_7, R_8, R_9, R_{10}, R_{11}, R_{12} and R_{13} are independently hydrogen or an alkyl group having 1 to 5 carbon atoms, at least one of said group being an alkyl group.

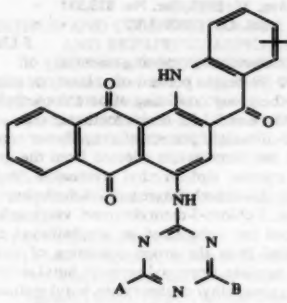
4,492,790

VAT DYESTUFFS OF THE TRISANTHRAQUINONYLAMINOTRIAZINE SERIES

Walter Hohmann, and Klaus Wunderlich, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

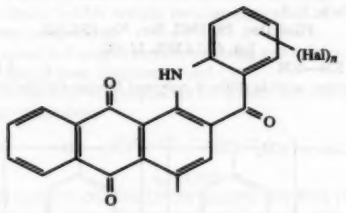
Filed Jan. 18, 1982, Ser. No. 339,943
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1981, 3103258
Int. Cl.³ C07D 401/12, 401/14
U.S. Cl. 544—188 **4 Claims**

1. A compound selected from the compounds of the formula

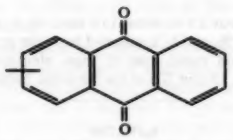


(I)

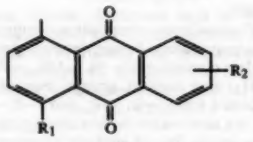
wherein A represents —NHV, —NHW or —NHZ and B represents —NHW or —NHZ,
in which
V represents a radical of the formula



W represents a radical of the formula



and Z represents a radical of the formula



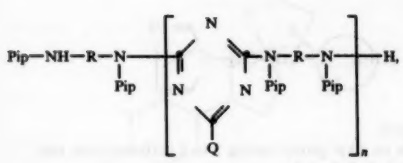
R_1 and R_2 are hydrogen or C_{1-4} alkylcarbonylamino, but do not simultaneously denote C_{1-4} alkylcarbonylamino,
Hal is a halogen atom and
n is a halogen atom and
n is the numbers 0, 1 or 2.

4,492,791
PROCESS FOR THE PREPARATION OF POLYAMINOTRIAZINES

Ivan Orban, and Eduard Troxler, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

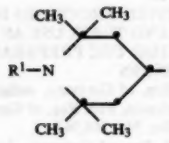
Filed Apr. 25, 1983, Ser. No. 488,246
Claims priority, application Switzerland, May 4, 1982, 2732/82
Int. Cl.³ C07D *401/14*
U.S. Cl. 544—198 8 Claims

1. An improved process for the preparation of a compound of formula I

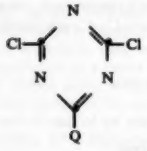


(I)

in which n is a number from 2 to 20, Pip is a radical of the formula



in which R^1 is hydrogen, C_1–C_{12}-alkyl, C_3–C_8-alkenyl, C_7–C_{11}-phenylalkyl, C_2–C_8-alkanoyl or C_3–C_5-alkenoyl, R is C_2–C_{12}-alkylene, which can be interrupted by —O— or —NR^2—, in which R^2 is hydrogen, C_1–C_{12}-alkyl, C_3–C_{12}-alkoxyalkyl, cycloalkyl, Pip or a divalent cycloaliphatic C_6–C_{15}-radical, and Q is a radical of the formula —OR^3, —NHR^4 or —NR^4R^5, in which R^3 is C_1–C_{12}alkyl, C_3–C_{12}-alkoxyalkyl, cyclohexyl, benzyl, phenyl, tolyl or Pip, R^4 is C_1–C_{12}-alkyl, C_3–C_{12}-alkoxyalkyl, C_4–C_{12}-dialkylaminoalkyl, allyl, benzyl, cyclohexyl, phenyl, tolyl or Pip and R^5 is C_1–C_{12}-alkyl, C_3–C_{12}-alkoxyalkyl or cyclohexyl, or R^4 and R^5 together with the N atom to which they are bonded form a 5- or 6-membered heterocyclic ring, by polycondensation of a dichlorotriazine of the formula II



(II)

with a diamine of the formula III

Pip—NH—R—NH—Pip (III)

in a molar ratio of 1 mol of dichlorotriazine of formula II to 1.0 to 1.2 moles of diamine of formula III in an inert organic solvent in the presence of a base wherein the improvement comprises

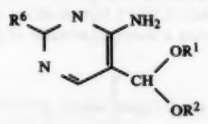
carrying out the reaction in a water-immiscible organic solvent and an aqueous solution of an inorganic base at a temperature of 140°–220° C. under elevated pressure.

4,492,792
PROCESS FOR PREPARING 4-AMINO-5-DIALKOXY-METHYLPYRIMIDINE DERIVATIVES

Kozo Fujii; Keigo Nishihira; Hiroyuki Sawada; Shuji Tanaka; Mamoru Nakai; Hiroshi Yoshida, and Teruhiko Inoue, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

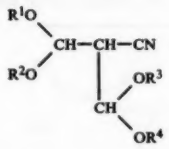
Filed Jan. 26, 1983, Ser. No. 461,191
Claims priority, application Japan, Feb. 4, 1982, 57-15503; Sep. 10, 1982, 57-156687
Int. Cl.³ C07D *239/02*
U.S. Cl. 544—326 18 Claims

1. A process for preparing a 4-amino-5-dialkoxymethylpyrimidine compound represented by the formula

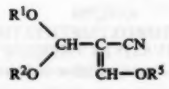


wherein R^1 and R^2 may be the same or different and each represent a lower-alkyl group having 1–4 carbon atoms or R^1 and R^2 may be lower-alkylene groups having 1–4 carbon atoms which are bonded to each other to form a a ring; and R^6 represents a hydrogen atom, a lower-alkyl group having 1–4 carbon atoms or a phenyl group wherein the hydrogen atom or atoms may be replaced by a lower-alkyl group having 1–3 carbon atoms, a lower-alkoxy group having 1 or 2 carbon atoms or a halogen atom,

which comprises reacting a propanenitrile compound represented by formula (I) or (II)



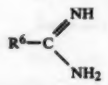
(I)



(II)

wherein R^1, R^2, R^3, R^4 and R^5 may be the same or different and each represent a lower-alkyl group having 1–4 carbon atoms or R^1, R^2, R^3 and R^4 may be lower-alkylene groups having 1–4 carbon atoms which are bonded to each other to form at least one ring,

with an amidine represented by the formula



wherein R^6 has the same meaning as defined above.

4,492,793

PROCESS FOR THE PRODUCTION OF 2-AMINO-5-MERCAPTO-1,3,4-THIADIAZOLE

Herbert Klenk, Hanau, Fed. Rep. of Germany, assignor to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

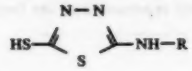
Filed Aug. 13, 1982, Ser. No. 408,131

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1981, 3133096

Int. Cl.³ C07D *285/12*

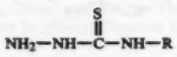
U.S. Cl. 548—141 21 Claims

1. A process for the production of a 2-amino-5-mercapto-1,3,4-thiadiazoles of the formula I:



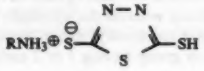
(I)

where R is hydrogen, an alkyl group of 1 to 10 carbon atoms, a cycloalkyl group of 5 to 6 carbon atoms or a phenyl group comprising reacting a thiosemicarbazide of the formula (II):



(II)

with carbon disulfide in aqueous phase wherein the aqueous phase has 15 to 70 weight % of an ammonium salt of bis-2,5-mercapto-1,3,4-thiadiazole of the formula (III):



(III)

at a temperature above 40° and 100° C.

4,492,794

2-GUANIDINO-4-HYDROXYMETHYLTHIAZOLE AND DERIVATIVES THEREOF

Kentaro Hirai, Kyoto, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

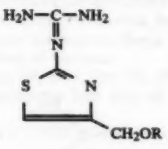
Filed Apr. 26, 1983, Ser. No. 488,821

Claims priority, application Japan, Oct. 27, 1981, 56/172391

Int. Cl.³ C07D *277/38*

U.S. Cl. 548—193 10 Claims

1. A compound of the formula:



wherein R is hydrogen, C_1–C_5 alkanoyl, C_1–C_5 alkanesulfonyl or C_6–C_8 arenesulfonyl.

4,492,795

ALKYLCYCLOALKYL IMIDAZOLYLMETHYL KETONES AS FUNGICIDE INTERMEDIATES

Wolfgang Krämer, Wuppertal; Manfred Jautelat, Burscheid, and Eckart Kranz, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

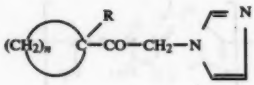
Filed Nov. 1, 1982, Ser. No. 438,087

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145858

Int. Cl.³ C07D *233/60*

U.S. Cl. 548—341 3 Claims

1. An alkylcycloalkyl imidazolylmethyl ketone of the formula



in which

R is an alkyl group having 1 to 6 carbon atoms, and

n is 3, 4, 5, 6 or 7.

4,492,796

ISOINDOLENINE DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS INTERMEDIATE PRODUCTS FOR THE PREPARATION OF DYESTUFFS

Manfred Lorenz, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

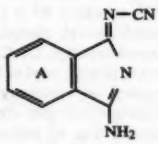
Filed Jun. 1, 1981, Ser. No. 268,963

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1980, 3022839

Int. Cl.³ C07D *209/44*

U.S. Cl. 548—471 2 Claims

1. A compound which, in one of its tautomeric structures, corresponds to the formula



in which the ring A can be substituted by one substituent selected from the group consisting of chlorine, bromine, nitro, C_1–C_6-alkyl, C_1–C_6-alkoxy, C_1–C_6-alkylsulphonyl, phenylsulphonyl, phenyl, cyano, amino, mono-C_1–C_4-alkylamino, di-C_1–C_4-alkylamino and acetylamino.

4,492,797

DEA-STEROIDS

Andor Fürst, Basel; Peter Keller, Reinach, and Marcel Müller, Frenkendorf, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

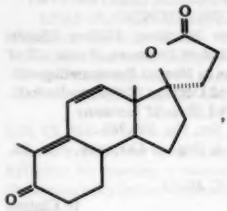
Continuation of Ser. No. 121,614, Feb. 14, 1980, abandoned. This application Oct. 4, 1982, Ser. No. 432,503

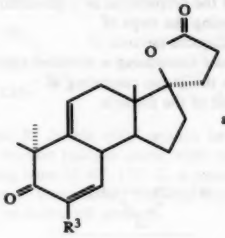
Claims priority, application Switzerland, Feb. 23, 1979, 1838/79; Jan. 10, 1980, 172/80

Int. Cl.³ C07D *307/94*

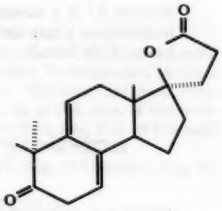
U.S. Cl. 549—265 5 Claims

1. A compound of a formula selected from the group consisting of





and



wherein R^3 is hydrogen or methyl.

4,492,798

PROCESS FOR PREPARING ARYLALKYLPYRUVIC ACIDS

John Y. Lee, and Joachim W. Wolfram, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 353,440, Mar. 1, 1982, abandoned. This application Jan. 13, 1983, Ser. No. 457,520

Int. Cl.³ C07C *51/10*

U.S. Cl. 562—406 **27 Claims**

1. A process for the production of an arylalkylpyruvic acid of the general formula:

$$(R)_n\text{—A—}(CH_2)_m CH_2COCOOH$$

or a salt thereof wherein:

A represents a benzene or naphthalene group,

each R, which may be the same or different, represents hydrogen or a linear or branched alkyl radical with up to 4 carbon atoms which is unsubstituted or substituted by a nitro group or by an alkoxy group containing 1 to 4 carbon atoms, or an alkoxy group containing 1 to 4 carbon atoms, or a halogeno, nitrile, nitro or alkylcarbonyloxy group,

n is 0 or an integer from 1–3 when A is a benzene group, and n is 0 or an integer from 1–5 when A is a naphthalene group and m is 1–20, which comprises carbonylating an arylalkyl halide of the general formula:

$$(R)_n\text{—A—}(CH_2)_m CH_2X$$

where R, n, A and m are defined above and X represents halogen, by reacting the arylalkyl halide in a liquid solvent medium of a mixture of water and alcohol, with carbon monoxide at elevated temperature and pressure in the presence of a catalytic amount of a metal carbonyl compound wherein said metal is iron, nickel, or cobalt and an alkali or an alkaline earth metal inorganic base to form a salt of the arylalkylpyruvic acid, and optionally then acidifying the salt to form said acid.

4,492,799

HALO-4-ALKENOIC ACIDS AND THEIR USE AS PESTICIDAL INTERMEDIATES

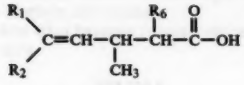
Thomas N. Wheeler, Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 2, 1979, Ser. No. 54,209

Int. Cl.³ C07C *61/40, 59/40*

U.S. Cl. 562—506 **5 Claims**

1. A halo-4-alkenoic acid compound of the structure:



wherein:

R_1 and R_2 independently halogen; and

R_6 is C_1 is C_3 alkyl or cycloalkyl.

4,492,800

PROCESS FOR THE PREPARATION OF 1,1-DICHLORO-ALKENES

Fritz Maurer, Wuppertal; Uwe Priesnitz, Solingen, and Hans-Jochem Riebel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

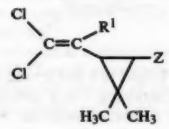
Continuation of Ser. No. 237,006, Feb. 23, 1981, abandoned. This application Feb. 22, 1983, Ser. No. 468,786

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 3009485

Int. Cl.³ C07C *69/74, 121/48, 121/60*

U.S. Cl. 562—506 **6 Claims**

1. A process for the preparation of a 1,1-dichloroalkene of the formula



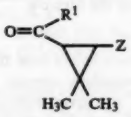
in which

R^1 is hydrogen, or an alkyl, alkenyl or alkinyl radical with up to 5 carbon atoms, or a cycloalkyl, phenalkyl, phenalkenyl, or phenyl radical,

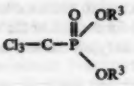
Z is an acetyl, cyano, carbamoyl or C_1 to C_4 alkoxycarbonyl radical, or a radical of the formula COOM, and

M is a hydrogen atom, an alkali metal, one equivalent of an alkaline earth metal or an ammonium radical,

consisting essentially of reacting a carbonyl compound of the formula



with a trichloromethanephosphonic acid ester of the formula



in which

R^3 each individually is a C_1 to C_4 alkyl or phenyl radical, or together are C_2 to C_5 alkanediyl,

in the presence of at least an equimolar amount of elemental magnesium metal based on the carbonyl compound at a temperature between about 0° and 150° C.

4,492,801

PRODUCTION OF N-SUBSTITUTED (METH)ACRYLAMIDES FROM (METH)ACRYLATES AND AMINES OVER A METAL ALKOXIDE CATALYST

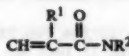
Edward E. McEntire; Kathy B. Sellstrom; Edward C. Y. Nieh, and David R. Livingston, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 28, 1983, Ser. No. 469,860

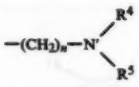
Int. Cl.³ C07C *102/06, 103/44*

U.S. Cl. 564—135 **10 Claims**

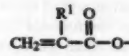
1. A process for the preparation of N-substituted acrylamides of the formula



where R^1 is hydrogen or methyl, R^2 is hydrogen or lower alkyl of 1 to 4 carbon atoms and R^3 is alkyl, aryl, alkaryl, aralkyl or alkoxyalkyl containing 1 to 20 carbon atoms or



where n is an integer from 2 to 6 and R^4 and R^5 taken singly are lower alkyl groups containing 1 to 4 carbon atoms or R^4 and R^5 taken jointly are combined with the N' atom to form a heterocyclic ring group selected from the group consisting of morpholine, pyrrolidine or piperidine ring groups, which process consists essentially of reacting an acrylate ester of the formula



where R^1 is defined as above and R^6 is lower alkyl of 1 to 4 carbon atoms with an amine of the formula HNR^2R^3 where R^2 and R^3 are defined as above over a catalytic amount of a metal alkoxide catalyst having the formula

$$M(OR^7)_x$$

where M is a metal atom selected from the group consisting of lanthanum, niobium, tantalum, copper, zinc, tin, lead, antimony and bismuth, R^7 is a lower alkyl group of one to four carbon atoms and x is two through five depending on the valence of the metal atom.

4,492,802

PROCESS FOR MANUFACTURE OF QUATERNARY AMMONIUM COMPOUNDS

Horst Rutzen, Langenfeld; Peter Nikolaus, Hilden; Martin Bischoff, Gelsenkirchen, and Rudolf Lehmann, Neuss, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf and Degussa Aktiengesellschaft, Frankfurt am Main, both of, Fed. Rep. of Germany

Filed Apr. 19, 1982, Ser. No. 369,760

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1981, 3116087

Int. Cl.³ C07C *89/02*

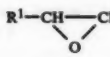
U.S. Cl. 564—292 **10 Claims**

1. A process for the preparation of a quaternary ammonium compound comprising the steps of

(I) forming an aqueous mixture of

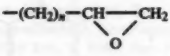
(a) a compound containing a terminal epoxy group selected from the group consisting of

(i) a compound of the formula



(I)

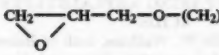
wherein R^1 is a straight or branched chain aliphatic hydrocarbon group having 4 to 16 carbon atoms or a group of the formula



(II)

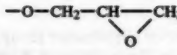
wherein n is an integer of from 4 to 16, and

(ii) a compound of the formula



(III)

wherein m is an integer of from 1 to 10, and R^2 is hydrogen, or a straight or branched chain aliphatic hydrocarbon group having from 1 to 24 carbon atoms, or a group of the formula



(IV)

(b) a salt of a tertiary amine which contains one or more alkyl, hydroxyalkyl, or aralkyl groups wherein such groups each contain less than 10 carbon atoms, and wherein the tertiary amines can optionally contain a C_{10} to C_{20} straight or branched chain alkyl or alkenyl group; and

(c) from about 0.5 to about 10% by weight, based on the theoretical weight of the quaternary ammonium compound reaction product, of a quaternary ammonium catalyst and

(II) heating said aqueous mixture to a temperature in the range of from about 40° to about 100° C. for a period of time sufficient to produce a quaternary ammonium compound from the reaction between compound (a) and compound (b) above.

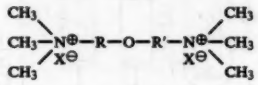
4,492,803

METHOD FOR PRODUCING BIS[β-(N,N-DIMETHYLAMINO)ALKYL]-ETHER

Sadakatsu Kumoi, Hikari; Keiji Mitarai, Shinnanyo, and Yukihiro Tsutsumi, Tokuyama, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Sep. 26, 1983, Ser. No. 536,028
Int. Cl.³ C07C 85/00
U.S. Cl. 564—486 14 Claims

1. A method for producing bis[β-(N,N-dimethylamino)alkyl]ether by reacting a bismethohalide of a bis[β-(N,N-dimethylamino)alkyl]ether represented by the following general formula



wherein R and R′ denote alkyl groups having 2–3 carbon atoms and X denotes halogen atom, with an aliphatic amine having a boiling point of 40°–170° C. at atmospheric pressure and having one or two primary amine groups in the molecule thereof under an increased pressure.

4,492,804

PREPARATION OF PRIMARY AMINES

Gerhard Frank, Hirschberg; Peter Rudolf, Neuhofen; Gerald Neubauer, Weinheim; Paul Duffner, Ludwigshafen; Manfred Ohlinger, Frankenthal; Hans J. Wilfinger, and Emil Pfannebecker, both of Schifferstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 18, 1983, Ser. No. 524,318
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1982, 3231193
Int. Cl.³ C07C 85/12
U.S. Cl. 564—493 8 Claims

1. A process for the preparation of a saturated primary amine by reacting a nitrile with hydrogen at elevated temperature under superatmospheric pressure in the presence of ammonia and a metallic iron catalyst which has been obtained by reducing an iron compound with hydrogen at ≦500° C., wherein a metallic iron catalyst which has been obtained from anisometric iron oxide particles is used.

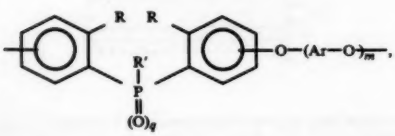
4,492,805

POLYARYLENE ETHERS CONTAINING PHOSPHORUS

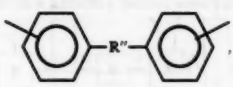
Siegmund Besecke, Seeheim-Jugenheim; Günter Schröder, Ober-Ramstadt; Werner Ude, Darmstadt-Arheilgen, and Winfried Wunderlich, Rossdorf, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jan. 26, 1983, Ser. No. 461,037
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1982, 3203186
Int. Cl.³ C07F 9/50, 9/53
U.S. Cl. 568—012 13 Claims

1. A polyarylene ether containing phosphorus and consisting of recurring units having the structure



wherein
m has an average value between 0 and 10;
q is 0 or 1;
R′ is methyl or phenyl;
R, taken alone, is hydrogen, or adjacent R's taken pairwise are oxygen or R″;
Ar is phenylene, naphthalene, or



wherein
R″ is a covalent single bond, sulfur, sulfonyl, carbonyl, methylene, isopropylidene, or another difunctional organic residue containing 5 to 15 carbon atoms and a number of carbon atoms which is at most equal to the number of carbon atoms in said residue;
said polyarylene ether having a reduced viscosity, $\eta_{sp/c}$, of at least 0.25 dl/g.

4,492,806

PROCESS FOR PREPARING ALKALI METAL SALTS OF HYDROXYAROMATIC COMPOUNDS

Ashok K. Mendiratta, Schenectady, and Wayne F. Morgan, Mechanicville, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 28, 1983, Ser. No. 555,752
Int. Cl.³ C07C 39/16
U.S. Cl. 568—723 15 Claims

1. A method for preparing at least one anhydrous alkali metal salt of a hydroxyaromatic compound which comprises:
(A) forming a solution of at least one hydroxyaromatic compound in a solvent mixture comprising (I) a major proportion of at least one substantially non-polar organic liquid which has a boiling point higher than that of water or which forms an azeotrope with water, and (II) a minor proportion of at least one alkanol containing up to about 4 carbon atoms, said alkanol being capable of removal by evaporation from the combination of said solvent mixture with water; the weight ratio of liquid I to liquid II being from 4:1 to about 8:1;
(B) reacting said solution at a temperature within the range of about 40°–100° C. with an aqueous solution of a substantially stoichiometric amount of alkali metal hydroxide for a period of time sufficient to form said alkali metal salt; and
(C) removing substantially all volatile materials, including water and said liquid II, from the reaction mixture by evaporation, thereby obtaining a slurry in said liquid I of said anhydrous alkali metal salt.

4,492,807

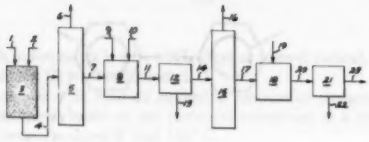
METHOD FOR PURIFICATION OF BISPHENOL A

Vinay P. Aneja, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 22, 1983, Ser. No. 487,546
Int. Cl.³ C07C 37/70
U.S. Cl. 568—724 12 Claims

1. In a method for purifying bisphenol A which includes the steps of adding up to about 15% by weight of water to a mixture comprising impure bisphenol A and phenol, heating said mixture to a temperature no higher than 100° C. at which it is

entirely liquid, and cooling said mixture to form an adduct of bisphenol A and phenol, the improvement which comprises adding to said mixture simultaneously with said water, up to about 15% by weight of an organic liquid which will not react



with bisphenol A or phenol in the presence of water under substantially neutral conditions and which dissolves a substantial proportion of the impurities or by-products produced in the reaction forming said bisphenol A, and subsequently crystallizing and separating said adduct.

4,492,808

METHOD FOR SEPARATING ETHANOL FROM AN ETHANOL CONTAINING SOLUTION

Rainer Hagen, and Jürgen Hartwig, both of Essen, Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

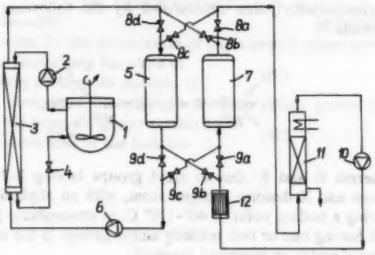
Filed Apr. 13, 1984, Ser. No. 600,301

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1983, 3313530

Int. Cl.[3] C07C *29/76, 28/86, 29/78, 31/08*

U.S. Cl. 568—916 **11 Claims**

1. A process for separating ethanol from an ethanol containing water solution, wherein the ethanol containing solution is extracted in an extraction stage with a solvent that is gaseous at 20° C. and 1 bar and is in the liquid or supercritical state in the extraction stage, and wherein the ethanol containing solvent phase is separated from the ethanol poor solution after extraction and is then separated into its components to recover the ethanol; said ethanol recovery comprising the steps of: passing the ethanol containing solvent phase from the extraction stage without changing pressure or temperature over an adsorption medium and returning the ethanol free solvent phase to the



extraction stage; driving out the ethanol from the adsorption medium with a gaseous extraction solvent stream at a pressure of 1 to 30 bar and at a temperature from 150° to 300° C.; cooling the gaseous extraction solvent which contains ethanol to below the boiling temperature of ethanol at the existing pressure to separate the stream into a liquid ethanol phase and a substantially ethanol free gas phase; and recirculating the substantially ethanol free gas phase.

4,492,809

THERMOELECTRICAL ARRANGEMENT

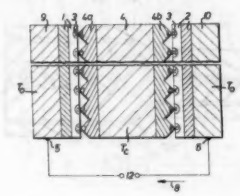
Reinhard Dahlberg, Innere Bergstrasse 32, 7101 Flein, Fed. Rep. of Germany

Continuation of Ser. No. 715,172, Aug. 17, 1976, abandoned. This application Dec. 4, 1979, Ser. No. 100,004

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1975, 2547262

Int. Cl.³ H01L *35/28*

U.S. Cl. 136—212 22 Claims



1. A thermoelectrical arrangement having large temperature gradients comprising a thermocouple having two thermolimbs including respectively different thermocouple materials and a bridging member which pressure contacts each of said thermolimbs at a respective plurality of points forming a respective planar array; and means for providing a temperature difference between said thermolimbs and said bridge member which temperature difference is sufficiently great to cause large temperature gradients greater than 10^4 degrees per centimeter in the regions of said plurality of points of contact whereby the specific heat conductivity at said regions is reduced as a result of inelastic scattering of electrons in said temperature gradients.

4,492,810

OPTIMIZED DOPED AND BAND GAP ADJUSTED PHOTORESPONSIVE AMORPHOUS ALLOYS AND DEVICES

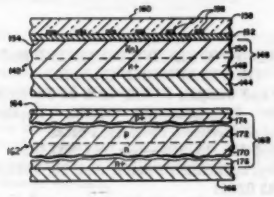
Stanford R. Ovshinsky, Bloomfield Hills, and Masatsugu Izu, Southfield, both of Mich., assignors to Sovonics Solar Systems, Solon, Ohio

Continuation-in-part of Ser. No. 368,221, Apr. 14, 1982, which is a division of Ser. No. 185,520, Sep. 9, 1980, Pat. No. 4,342,044, which is a continuation-in-part of Ser. No. 884,664, Mar. 8, 1978, Pat. No. 4,217,374, and Ser. No. 104,285, Dec. 17, 1979, abandoned, which is a division of Ser. No. 884,664, . This application Nov. 19, 1982, Ser. No. 442,895

The portion of the term of this patent subsequent to Jul. 27, 1999, has been disclaimed.

Int. Cl.³ H01L *31/06*

U.S. Cl. 136—255 83 Claims



58. An improved photoresponsive device, said device comprising superimposed layers of various materials including an amorphous semiconductor alloy body having an active photoresponsive region including a band gap therein upon which radiation can impinge to produce charge carriers, said amorphous alloy including at least one density of states reducing element, said alloy further including one of a dopant or a band gap adjusting element therein to enhance the radiation absorption thereof without substantially increasing the effective states in the gap, at least one of said layers being formed with a plurality of substantially discrete subportions therein.

78. The device as defined in claim 58 wherein said alloy body forms part of a Schottky barrier solar cell.

4,492,811

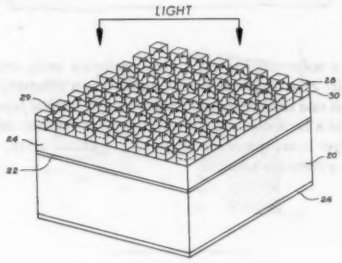
HETEROJUNCTION PHOTOVOLTAIC DEVICE

Jay A. Switzer, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 1, 1983, Ser. No. 518,814

Int. Cl.³ H01L *31/06*

U.S. Cl. 136—255 41 Claims



1. A photovoltaic device comprising a conductive solid coating material containing a degenerate n-type semiconductor having a band gap from about 0.5 to about 2.35 e.V. forming a heterojunction with a solid substrate containing an n-type semiconductor material.

12. The device defined in claim 1 further comprising a thin layer of material having a band gap greater than about 3.0 e.V. between said semiconductor material and said coating material.

4,492,812

ELECTRICAL CONTACTS FOR A SOLAR CELL

Joseph Lindmayer, Potomac, Md., assignor to Solarex Corporation, Rockville, Md.

Continuation-in-part of Ser. No. 281,380, Jul. 8, 1981, Pat. No. 4,392,010, which is a continuation-in-part of Ser. No. 3,945, Jan. 16, 1979, Pat. No. 4,297,391. This application Jun. 2, 1983, Ser. No. 500,404

The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.

Int. Cl.³ H01L *31/04, 31/18*

U.S. Cl. 136—256 24 Claims

12. A silicon containing photovoltaic cell having a front surface adapted to receive and absorb light impinging thereon and a back surface opposed to said front surface, and an electrical contact covering at least a portion of at least one of said surfaces, said contact being comprised of a layer of a mixture of aluminum and a solderable soft metal, said solderable metal consisting essentially of a combination of tin and a minor amount of silver, said combination of tin and silver comprising at least about 10% of said mixture.

4,492,813

AMORPHOUS SILICON SOLAR CELL

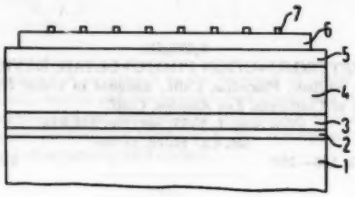
Helmold Kausche; Matthias Moeller, and Franz Fischer, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 18, 1983, Ser. No. 524,438

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1982, 3242835

Int. Cl.³ H01L *31/04*

U.S. Cl. 136—256 **6 Claims**



1. In a solar cell having a semiconductor body composed essentially of amorphous silicon applied to a substrate having at least at one surface thereof comprised of a metal layer functioning as a back contact, the improvement wherein said back metal layer is composed of an aluminum-silicon alloy, with or without a titanium additive.

4,492,814

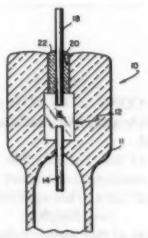
SOLDER GLASS AND ELECTRICAL DEVICE EMPLOYING SAME

Richard G. Snell, Topsfield, and Fredrick A. Loughridge, Ipswich, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 4, 1984, Ser. No. 568,030

Int. Cl.³ H01J *5/00*; H05K *5/06*

U.S. Cl. 174—50.64 **2 Claims**



2. A seal for electrical devices comprising a body of substantially fused silica and at least one electrically conductive member sealed therein, said member comprising a proximal portion projecting within said body, an intermediate thin foil portion hermetically sealed within said body, and a distal portion projecting exteriorly of said body, and a capillary passage surrounding said distal portion and extending to said intermediate portion, said capillary passage being substantially filled with a solder glass comprising: about 65 weight percent Sb_2O_3; about 30 weight percent B_2O_3; and about 5 weight percent Bi_2O_3.

4,492,815

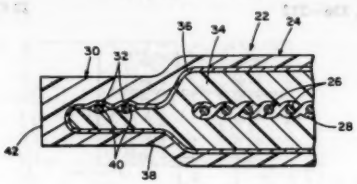
SHIELDED JACKETED FLAT CABLE AND GROUNDING CLIP FOR USE THEREWITH

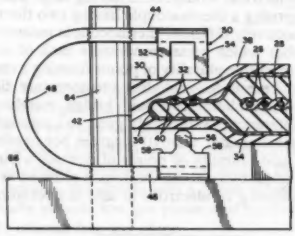
Ronald R. Maros, Itasca, Ill., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 23, 1983, Ser. No. 525,643

Int. Cl.³ H01B *7/08*; H01R *4/24*

U.S. Cl. 174—78 **10 Claims**





1. The combination of a metallic grounding clip and a shielded, jacketed flat cable of the type comprising a main portion having a plurality of spaced signal conductors, an offset portion joined to said main portion and including a drain wire spaced from a distal side of said offset portion, and a metallic shield which encompasses said signal conductors and extends into said offset portion in contact with said drain wire, said clip comprising:

a first leg;

a second leg; and

a web joining said legs and defining therewith a channel receiving said offset portion, at least one of said legs comprising a termination means piercing said offset portion to contact said drain wire whereby said clip can be attached to said cable, remote from said signal conductors, at any desired location along its length and the shield of said cable can extend to the cable ends.

4,492,816

SPLICE-PROTECTING SLEEVE FOR ELECTRIC CABLES OR TELEPHONE CABLES

André Morel, and Jacques Morel, both of Favieres, France, assignors to Etablissements Morel, Ateliers Electromecaniques de Favieres, Favieres, France

Filed Jun. 13, 1983, Ser. No. 503,582

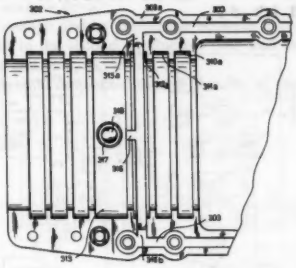
Claims priority, application France, Jun. 30, 1982, 82 11467; Feb. 18, 1983, 83 02641

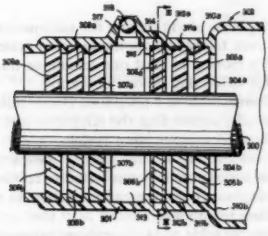
Int. Cl.³ H02G *15/18, 15/113*

U.S. Cl. 174—92 **19 Claims**

1. A sleeve for protecting cable splices, comprising two half-shells having longitudinal flanges, said half-shells being adapted to be assembled together around a splice by means of said flanges, a channel in said flanges defining a duct in the assembled position, means for introducing material in paste form into said duct so as to ensure fluid-tightness between said flanges, the opposite ends of the sleeve having jaws adapted to

be clamped against the cable at the time of assembly of the two half-shells, a chamber which communicates with said duct, said chamber being defined between at least two of said jaws, said chamber communicating with said duct by means of a





channel formed around the entire periphery of a said jaw which is adjacent to said chamber, said channel being formed at the bottom of a recess in said half-shells in which said jaw is fitted.

4,492,817

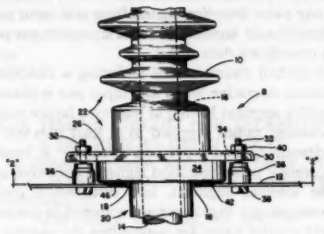
WATERTIGHT BUSHING AND BOLT MOUNTING ASSEMBLY

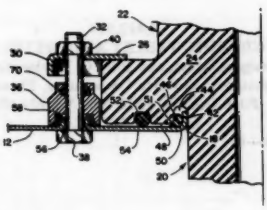
Donald W. Selby, Brentwood, Tenn., assignor to Square D Company, Palatine, Ill.

Filed Mar. 1, 1982, Ser. No. 353,785
Int. Cl.³ H01B *17/30*
U.S. Cl. 174—152 R **12 Claims**

1. A watertight bushing assembly comprising:
a wall member having an opening;
an upturned flange peripherally surrounding said opening and extending generally perpendicular to said wall member;
a bushing extending through said opening, said bushing including an elongate body portion and a collar portion surrounding said body portion and overlying said wall member around said opening, said collar portion having a circular first groove receiving said flange, said first groove being defined by a first surface coextensive with said body portion, a spaced apart second surface and a bridging portion extending between said first surface and said second surface;
a resilient first seal member received in said first groove intermediate said flange and said second surface, said flange abutting against said first surface; and
means securing the bushing to the wall member with the resilient first seal member resiliently squeezed within the first groove between the second surface and the flange.

7. A watertight bolt mounting assembly comprising:
a wall member including a plurality of bores, each having a surrounding lip;
a plurality of bolts substantially perpendicular to said wall member and passing through the respective bores in the wall member;
a plurality of resilient bolt seal members surrounding said lips and bores; and





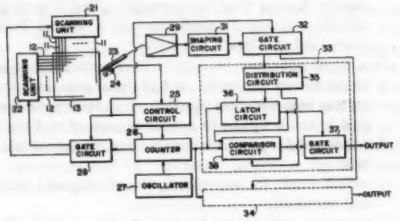
a plurality of nuts each having a hole therethrough receiving a respective bolt, each nut also having a cavity surrounding the hole receiving a respective lip, each nut being tightened onto its respective bolt to squeeze the respective bolt seal member between the nut and the respective lip.

4,492,818

TABLET INPUT APPARATUS

Kiyomi Abe, Soka, Japan, assignor to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1982, Ser. No. 441,779
Claims priority, application Japan, Nov. 14, 1981, 56-182682
Int. Cl.³ G08C *21/00*
U.S. Cl. 178—18 **3 Claims**



1. A tablet input apparatus comprising:
a tablet comprising a matrix having two sets of a group of conductors arranged in spaced relation along coordinate axes to define a plurality of lattice points, and a segment including at least one of the lattice points of said matrix, said segment being, as a separate key, associated with a symbol representative of said key;
a pair of scanning units respectively connected to said two

sets of a group of conductors to sequentially supply scanning pulses to said each set of a group of conductors;

an input pen for detecting said scanning pulses from the desired said segment of said tablet and producing corresponding scanning pulse detection signals; and

control circuit means for supplying a control signal to each of said pair of scanning units and for receiving the scanning pulse detection signals from said input pen thereby to specify said segment selected by said input pen to output a coordinate data signal,

said control circuit means including a distribution control circuit operative when said input pen is placed in contact with a segment having at least two lattice points to detect scanning pulses supplied to at least two said conductors adjacent to said input pen to render at least one of the scanning pulse detection signals ineffective in specifying the selected segment, said distribution control circuit comprising a logical circuit actuated in cooperation with said control signal for controlling the passing of the scanning pulse detection signals.

4,492,819

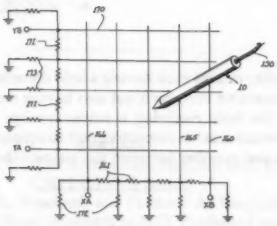
GRAPHIC TABLET AND METHOD

James L. Rodgers, Mesa, and Billy C. Fowler, Scottsdale, both of Ariz., assignors to Kurta Corporation, Phoenix, Ariz.

Filed Dec. 30, 1982, Ser. No. 454,695

Int. Cl.³ G08C *21/00*

U.S. Cl. 178—18 **12 Claims**



4. Apparatus for determining the position of an instrument on a surface comprising:

a. a plurality of grid conductors oriented in X and Y directions, all X conductors interconnected by resistors, said plurality of X conductors having a pair of terminals, a first X terminal connected to a first X conductor and a second X terminal connected to a last X conductor, all Y conductors interconnected by resistors, said plurality of Y conductors having a pair of terminals, a first Y terminal connected to a first Y conductor and a second Y terminal connected to a last Y conductor;

b. a signal generator for generating an electrical signal;

c. an instrument connected to said signal generator for transmitting said electrical signal through said surface into said grid to cause signals to appear at each of said terminals;

d. a detector for sequential connection to each of said terminals;

e. switch means for sequentially connecting said detector to said terminals;

f. means for ratioing the level of the signals at the X terminals and for ratioing the level of the signals at the Y terminals;

g. means responsive to the ratio of signal levels at the X terminals for generating a digital signal proportional to the instrument position in the X direction;

h. means responsive to the ratio of signal levels at the Y terminals for generating a digital signal proportional to the instrument position in the Y direction.

4,492,820

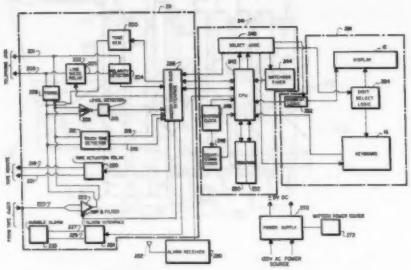
TELEPHONE ALARM SYSTEM

Lon H. Kennard, Heber; Duane O. Hall, Sandy, and Richard M. Bangerter, South Jordan, all of Utah, assignors to Salt Lake Communications, Inc., Salt Lake City, Utah

Filed Oct. 24, 1980, Ser. No. 200,368

Int. Cl.³ H04M *11/00*

U.S. Cl. 179—5 P **51 Claims**



1. A telephone alarm device for automatically transmitting messages over telephone communication systems, comprising:

means for storing at least one telephone number;

means for activating device operation;

means connectable to a telephone communication system for electrically connecting the telephone alarm device to said telephone communication system;

means connectable to the storing means for transmitting signals corresponding to selected telephone numbers onto the telephone communication system so as to call corresponding telephones;

means connectable to the telephone communication system for detecting if a telephone corresponding to a selected telephone number is answered, said answer detecting means indicating that said telephone is answered both upon detecting reversal of voltage polarity on the telephone communication system and, if no such voltage polarity reversal is detected, upon detecting a predetermined number of odd count signls on the telephone communication system;

means connectable to the telephone communication system for detecting incoming telephone calls; and

means, responsive to the answer detecting means, for transmitting signals corresponding to a message onto the telephone communication system after the answer detecting means indicates that a telephone corresponding to a selected telephone number is answered.

4,492,821

SUBSCRIBER CONNECTION CIRCUIT

Horst Kopetzky, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 3, 1982, Ser. No. 404,710

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3133934

Int. Cl.³ H04M *3/06, 3/22*

U.S. Cl. 179—18 FA **10 Claims**

1. A subscriber connection circuit for monitoring the state of excitement of subscriber loop interruptions due to dialing and clearance and for monitoring loop closure as a result of a call for a subscriber station which is indirectly connected across a feed battery by first and second conductive paths respectively connected in series with first and second conductors of a subscriber line, said subscriber connection circuit comprising:

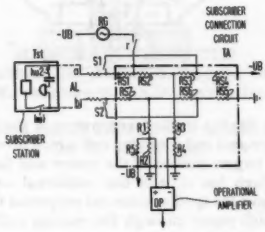
an analysis device including first and second inputs and an output and operable to provide a signal at said output which represents the difference and direction of voltages applied to said first and second inputs;

a plurality of resistors connected in series with junctions therebetween in each of said first and second conductive paths, a first of said junctions in said first conductive path serving as a ringing current input;

a first voltage divider connected between a second of said junctions in said first conductive path and said first input of said analysis device;

a second voltage divider connected between a third of said junctions in the second conductive path and said second input of said analysis device; and

switching means connected to said plurality of resistors and



operable to a first condition in which all of said resistors serve as feed resistors and to a second condition in which some of said resistors serve as feed resistors and others become parts of said first and second voltage dividers and provide ringing voltage components at said first and second inputs of said analysis device in response to ringing current,

said resistors, said first, second and third junctions and said first and second voltage dividers selected to provide that the ringing voltage components compensate one another at said first and second inputs of said analysis device when the subscriber loop is open.

4,492,822

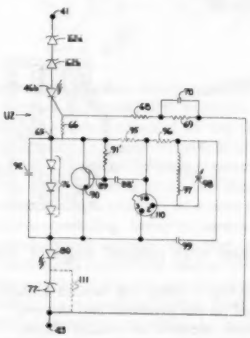
TELEPHONE HOLD CIRCUIT WITH IMPROVED SELF-LIMITING AMPLIFIER FOR INJECTING AN AUDIO SIGNAL DURING HOLD CONDITIONS

Robert J. Alderman, 3406 G-7 Ranch Rd., Ruskin, Fla. 33570

Filed Sep. 30, 1982, Ser. No. 430,945

Int. Cl.³ H04M *1/00*

U.S. Cl. 179—81 R **4 Claims**



1. In a telephone hold circuit of the type including an arrangement for injecting an audio signal from an audio signal source into a loop circuit conducting loop current, the improvement of a limiting output stage comprising in combination:

a transistor characterized by a pair of main terminals and control terminal;

a series connection of N formed biased diodes, N being an integer greater than zero, connected between said main terminals;

means operatively connecting said main terminals to said loop circuit to conduct said loop current when said hold circuit is in an active condition; and

means connecting said control terminal to said audio signal source.

4,492,823

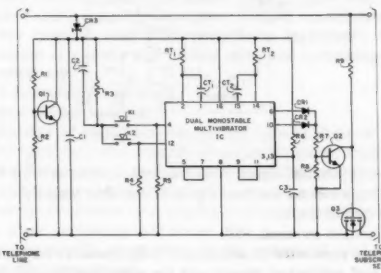
DUAL TIMING CIRCUIT FOR TELEPHONE SUBSCRIBER'S INSTRUMENT

Miranda L. James, Hartselle, and Albert Teater, Huntsville, both of Ala., assignors to GTE Business Communication Systems, Northlake, Ill.

Filed May 2, 1983, Ser. No. 490,770

Int. Cl.³ H04M *1/00*

U.S. Cl. 179—81 R **10 Claims**



1. A timing circuit for use with a subscriber's telephone instrument connected to a telephone line, said timing circuit comprising: a first monostable multivibrator operable for a first predetermined period of time and including a first input and first output; a second monostable multivibrator operable for a second predetermined period of time and including a second input and a second output; switching means connected to said telephone line; gating means connected between said switching means and said first and second outputs; first trigger means connected to said first monostable multivibrator, said first monostable multivibrator operated to generate a signal at said first output for a first predetermined period of time in response to the manual operation of said first trigger means; second trigger means connected to said second monostable multivibrator, said second monostable multivibrator operated to generate a signal at said second output for a second predetermined period of time in response to the manual operation of said second trigger means; said gating means operated in response to said signal at said first output to operate said switching means to simulate at said telephone line an "on-hook" condition for said first predetermined period of time and alternately said gating means operated in response to said signal at said second output to operate said switching means to simulate at said telephone line an "on-hook" condition for said second predetermined period of time.

4,492,824

SPEAKERPHONE LINEAR COMPARATOR

Steve W. Bell, Eatontown, N.J., and Milton L. Embree, Reading, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 11, 1983, Ser. No. 522,106

Int. Cl.³ H04M *9/08*

U.S. Cl. 179—81 B **17 Claims**

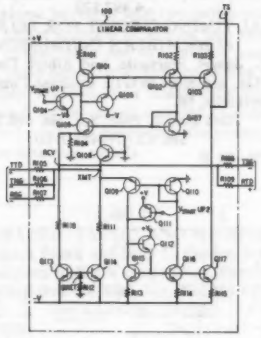
1. A linear comparator having a first group and a second group of input terminals, comprising

a first summing node for summing ones of signals inputted to said first group of terminals,

means connected to said first node for holding said first node at a constant potential and for accepting a first summed signal of a first polarity and for blocking a first summed signal of a second polarity,

a second summing node for summing ones of signals inputted to said second group of terminals,

means connected to said second node for holding said second node at a constant potential and for accepting a second summed signal of said second polarity and for blocking a second summed signal of said first polarity,



an output node,

an output terminal, and

means connected to said output node operative for summing said unblocked signals and for supplying to said output terminal a signal representative of the difference between said unblocked signals and wherein said output node supplying a null signal to said output terminal during the absence of said unblocked signals.

4,492,825

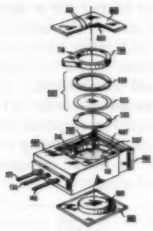
ELECTROACOUSTIC TRANSDUCER

Alex M. Brzezinski; Harold J. Hershey, and Stephen R. Whitesell, all of Indianapolis, Ind., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 28, 1982, Ser. No. 402,613

Int. Cl.³ H04R *19/01, 19/00, 17/00*

U.S. Cl. 179—111 R **27 Claims**



1. An electroacoustic transducer comprising:

a unitary discrete electrically conductive member from which both a plurality of leads and a backplate are formed;

a diaphragm positioned adjacent to the backplate; and

means for providing electrical interconnection between the backplate and at least one of the leads.

4,492,826

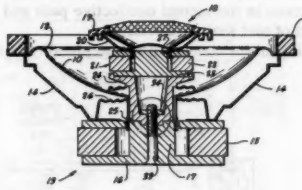
LOUDSPEAKER

Robert C. Chiu, Downey, Calif., assignor to R&C Chiu International, Inc., City of Industry, Calif.

Filed Aug. 10, 1982, Ser. No. 406,780

Int. Cl.³ H04R *1/24*

U.S. Cl. 179—115.5 PS **3 Claims**



1. A high fidelity loudspeaker system of the type having a permanent magnet and a moving coil which drives the speaker cone of the largest speaker of the system and further being of the type which has at least one additional smaller speaker mounted above the speaker cone and supported from a support member which passes through the moving coil, wherein the improvement comprises:

a first support pedestal affixed to the permanent magnet of the largest speaker having the first of a set of non-circular keyed male and female interlocking members:

a second support pedestal affixed to the permanent magnet of at least one of the smaller speakers, said second support pedestal having the second of a set of keyed male and female interlocking members; and

fastening means passing through said first support pedestal and terminating within said second support pedestal to hold the two pedestals together, whereby a second smaller speaker may be securely held above the cone of a larger speaker even when the assembly is subjected to the vibration of a motor vehicle.

4,492,827

HORN SPEAKER WITH REDUCED MAGNETIC FLUX LEAKAGE

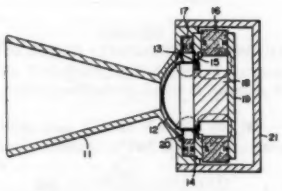
Yoshishige Shintaku, Takarazuka, Japan, assignor to Ibuki Kogyo Co., Ltd., Osaka, Japan

Filed Jun. 27, 1983, Ser. No. 508,248

Claims priority, application Japan, Jan. 31, 1983, 58-12679

Int. Cl.³ H01F *7/00*

U.S. Cl. 179—115.5 SF **2 Claims**



1. A horn speaker with reduced magnetic flux leakage, comprising:

a diaphragm having a voice coil wound around a tubular portion formed on the proximal end thereof;

a primary magnetic piece of an annular shape;

a primary yoke of an annular shape securely fixed on the front surface of the primary magnetic piece concentrically thereto;

a secondary yoke of a discoidal shape securely fixed on the rear surface of the primary magnetic piece concentrically thereto; and

a central pole piece extending from the front surface of the

secondary yoke, defining a gap between the inner periphery of the primary yoke and the periphery of the free end of the pole piece;

further comprising:

a secondary magnetic piece securely fixed on the front surface of the primary yoke concentrically thereto;

the primary and the secondary magnetic pieces opposing one another with the ends of a same polarity;

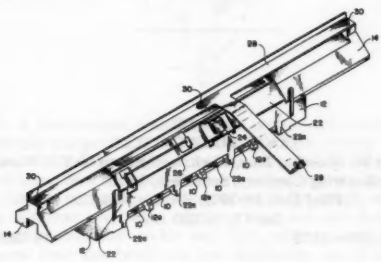
whereby magnetic flux leakage from the primary magnetic piece is reduced and the magnetic flux extending through the gap is mutually intensified by the primary and the secondary magnetic pieces.

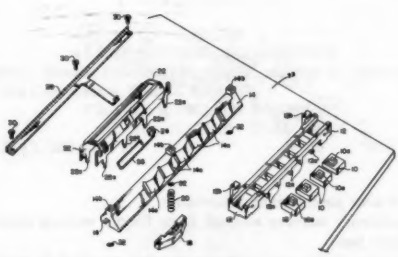
4,492,828

SLIDE SELECTOR SWITCH

Arthur T. Martinez, and Richard B. Kilstofte, both of Long Beach, Calif., assignors to T.A.D. Avanti, Inc., Compton, Calif.

Filed Jul. 25, 1983, Ser. No. 517,004
Int. Cl.³ H01H *9/26*
U.S. Cl. 200—5 R **7 Claims**





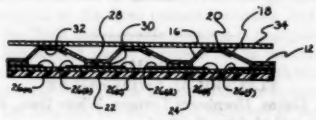
1. A mechanical selector switch assembly for selectively operating a series of pushbutton switches, said pushbutton switches being mounted adjacent to one another and each including an operating element movable from a first position to a second position, said selector switch assembly including: an elongated support extending over the series of pushbutton switches and including a plurality of spaced and parallel transverse members extending between successive ones of the switches; an elongated actuator mounted on the support for reciprocal movement therealong, said actuator having a series of detents formed thereon; a plunger mounted on the underside of said actuator for movement thereby from between one pair of said parallel transverse members to another to move the operating element of a corresponding one of said pushbutton switches to its second position as the plunger is positioned between the corresponding pair of transverse members; an elongated housing mounted on said support and extending over said actuator; and a spring-biased roller mounted on said housing in position successively to engage said detents as the actuator is reciprocally moved along the support.

4,492,829

TACTILE MEMBRANE KEYBOARD WITH ASYMMETRICAL TACTILE KEY ELEMENTS

Leo J. Rodrique, Ipswich, Mass., assignor to Rogers Corporation, Rogers, Conn.

Continuation of Ser. No. 352,310, Feb. 25, 1982, abandoned. This application Feb. 13, 1984, Ser. No. 579,814
Int. Cl.³ H01H *13/70*
U.S. Cl. 200—5 A **26 Claims**



1. A tactile snap action switch element comprising:

a sheet of base material; and

at least one snap action protrusion having a first wall segment and a second wall segment formed in said sheet of base material, said protrusions being asymmetric with respect to a center axis thereof or a plane containing said center axis.

5. A keyboard comprising:

a sheet of base material;

a plurality of tactile elments formed in said sheet of base material, each of said tactile elements being a protrusion in said base material, each of said protrusions having a first wall segment and a second wall segment, said protrusions being asymmetric with respect to a center axis thereof or a plane containing said center axis;

first electrically conductive means associated with each tactile element; and

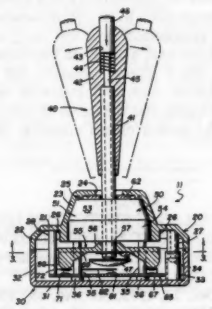
second electrically conductive means aligned with each of said tactile elements, said first electrically conductive means contacting said second electrically conductive means to complete an electric circuit upon actuation of each of said tactile elements.

4,492,830

JOYSTICK WITH SINGLE-LEAF SPRING SWITCH

Syng N. Kim, Hoffman Estates, Ill., assignor to Wico Corporation, Niles, Ill.

Filed Mar. 28, 1983, Ser. No. 479,317
Int. Cl.³ H01H *19/00*
U.S. Cl. 200—6 A **15 Claims**



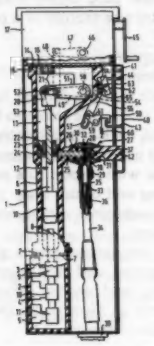
1. In a joystick controller including a housing and handle means tiltably mounted on the housing for actuating direction control switches in the housing, the improvement comprising: a printed circuit board having an aperture therethrough and having printed thereon a fixed contact of a direction control

switch, a single resilient leaf spring contact member of the direction control switch mounted on said circuit board for movement between a normal open condition spaced from said fixed contact and a closed condition contacting said fixed contact, said leaf spring contact member having a tab projecting therefrom and disposed through said aperture for connection to circuitry on the opposite side of said circuit board, and actuator means disposed in the housing spaced from said printed circuit board and responsive to tilting movement of the handle means for directly engaging and selectively moving said leaf spring contact member to the closed condition thereof.

4,492,831
ELECTRICAL SWITCHGEAR

Martin C. Oakes, Hornbeam Cottage, White Gate, East Keswick, West Yorkshire, England

Filed Apr. 1, 1983, Ser. No. 481,274
Claims priority, application United Kingdom, Apr. 5, 1982, 8210054
Int. Cl.³ H01H *9/22*
U.S. Cl. 200—50 A **7 Claims**



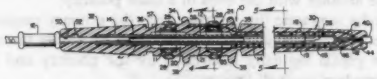
1. Electrical switchgear comprising a chamber; input contacts, output contacts and earth contacts located within the chamber; switch means within the chamber for connecting the input and output contacts or for connecting the output and earth contacts; a conductor electrically connected to the output contacts and extending through a wall of the chamber; a connector unit located externally of the chamber and providing first contact means for connection to the conductor, second contact means for connection to an output conductor and third contact means for connection to a test unit; a housing surrounding the connector unit; a cover on the housing, the cover being openable to allow direct access to the third contact means of the connector unit; and interlock means coupled between the switch means and the cover to prevent opening of the cover unless the switch means connects the output and earth contacts.

4,492,832
HAND-CONTROLLABLE SWITCHING DEVICE FOR ELECTROSURGICAL INSTRUMENTS

Glenn N. Taylor, Longmont, Colo., assignor to Neomed, Incorporated, Boulder, Colo.

Filed Dec. 23, 1982, Ser. No. 452,450
Int. Cl.³ H01H *35/00, 13/08*; A61B *17/36*
U.S. Cl. 200—52 R **16 Claims**

1. A hand-controllable electrical switching device comprising an elongated hollow body composed of electrically insulative material, an elongated electrical conductor positioned longitudinally within the hollow interior of said body and being hollow at one end, a tool inserted lengthwise through one end of said body into said hollow end of said electrical conductor for electrical connection therewith, and at least one electrical lead extending into said body in spaced relation to said electrical conductor; and an annular contact member disposed in said body in normally outer, spaced concentric relation to said electrical conductor and connected to said

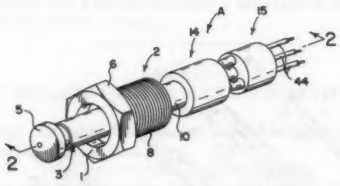


electrical lead, and means resiliently mounting said annular contact member normally away from contact with said electrical conductor and said annular contact member being depressible under hand pressure at any point on the circumference of said body surrounding said annular contact member to cause said annular contact member to move into contact with said electrical conductor.

4,492,833
DOOR JAMB SWITCH

Michael W. Malesko, Troy, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Oct. 15, 1982, Ser. No. 434,523
Int. Cl.³ H01H *3/16*
U.S. Cl. 200—61.78 **18 Claims**



1. A door jamb switch comprising:

a stationary member adapted to be fixedly secured onto a door jamb;

a plunger within said stationary member mounted for reciprocation along an operating axis by a door between a first position and a second position;

first and second support members with first and second electrical contacts respectively supported thereon, said first and second support members being mounted along said operating axis with said first support member fixed with respect to said stationary member and said second support member on said plunger and movable therewith so as to provide for relative movement of said support members with respect to each other between first and second positions in response to the reciprocation of the plunger, the first position having said contacts in biased engagement with each other and the second position having said contacts disengaged from each other; and

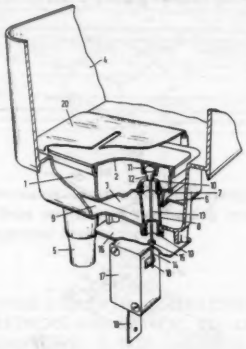
at least one of said first and second support members including a member of resilient material separate from its respective electrical contact which member yieldingly supports said respective electrical contact for angular displacement relative to said operating axis during engagement of said contacts with each other.

4,492,834

FLOAT CONTROL FOR A SWITCH

Gerard C. Smit, Amerongen, Netherlands, assignor to Smitdesign B.V., Amerongen, Netherlands

Filed Apr. 13, 1982, Ser. No. 367,956
Claims priority, application Netherlands, Apr. 24, 1981, 8102042
Int. Cl.³ H01H 35/18
U.S. Cl. 200—84 R 6 Claims



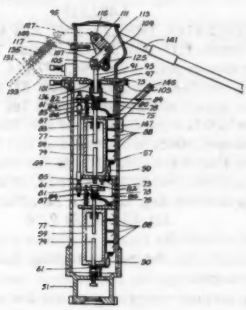
1. A float control assembly for a push-button switch, said assembly comprising a float chamber, a float having a fixed, substantially horizontally extending pivot axis being located within said float chamber; a two-armed lever having a fulcrum, one arm of said lever extending substantially at right angles to the said float pivot axis, said lever arm and said float being mutually connected within said float, said connection being spaced from said pivot axis and facilitating mutual pivoting movements, said lever being slideable at least at its fulcrum and the other lever arm actuating said push-button.

4,492,835

LOAD INTERRUPTER DEVICE

John L. Turner, Fairview Heights, Ill., assignor to Turner Electric Corporation, East St. Louis, Ill.

Filed Jul. 8, 1982, Ser. No. 396,457
Int. Cl.³ H01N 33/66
U.S. Cl. 200—144 B 17 Claims



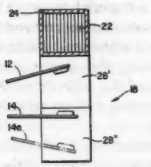
1. A load interrupter device for use with air break switch gear comprising an elongated housing of dielectric material, at least one vacuum bottle positioned within said housing and having a fixed and a movable contact axially aligned with respect to said fixed contact in the bottle, said axially movable contact being movable between a closed position engageable with said fixed contact and an open position spaced from said fixed contact, interrupter operating mechanisms including a mechanism housing secured to one end of said elongated housing, an operating shaft journaled in the walls of the mechanism housing and extending transversely of said elongated housing with its axis substantially co-planar with the axes of said fixed and movable contacts, an operating arm connected to the operating shaft, a first toggle link rotatably journaled on said operating shaft and extending outwardly therefrom to an opposite end, a second toggle link pivoted to the opposite end of said first toggle link at a location spaced from said operating shaft, means pivotally connecting the other end of said second toggle link to means for controlling the position of the movable contact relative to the fixed contact including first means to maintain the fixed and movable contacts in engagement when the first and second toggle members are in substantial alignment, second means operatively engageable with the pivotally connected other ends of the toggle members including means to cause the first and second toggle members to move out of alignment and to cause the movable contact to move away from the fixed contact, said last named means including a lost motion connection, and means on the mechanism housing engageable with the toggle links adjacent to the pivotally connected ends thereof to control and maintain the positions of the toggle links in their substantially aligned condition.

4,492,836

ARC MOTIVATING ASSEMBLY FOR CIRCUIT BREAKERS

Franco P. Pardini, Milan, and Francesco De Vizzi, San Giuliano, both of Italy, assignors to General Electric Company, New York, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,678
Claims priority, application Italy, May 25, 1982, 21463 A/82
Int. Cl.³ H01H 33/00
U.S. Cl. 200—144 R 6 Claims



1. An improved arrangement for enhancing arc blow out and extinction between the contacts of circuit breakers of the type containing an arc motivating assembly which includes two opposing columns of magnetic plates along said contacts, wherein the improvement comprises:

first and second insulating materials on said magnetic plates, said first insulating materials providing high dielectric strength and high arc resistance without low electrical resistance track formation, said second insulating material becoming vaporized upon the occurence of an arc between said contacts and emitting gas to assist in the blow out and extinction of said arc without maintaining its insulating properties after exposure to said arc.

4,492,837

GUIDE MEANS FOR THE MOVABLE CONTACT ROD OF A VACUUM INTERRUPTER

Donald W. Crouch, Newton Square, and Joseph C. Sofianek, Broomall, both of Pa., assignors to General Electric Company, New York, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,554
Int. Cl.³ H01H 33/66
U.S. Cl. 200—144 B 9 Claims

1. A vacuum type circuit interrupter comprising:

(a) an evacuated envelope comprising a cylindrical shell of

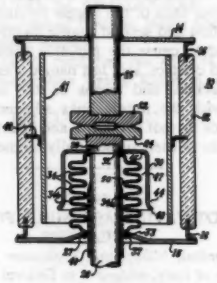
electrical insulating material and an end plate extending transversely of said shell and joined thereto in sealed relationship, said end plate having a central opening therein,

(b) a movable contact rod extending through said central opening generally axially of said shell,

(c) a contact joined to said rod at the inner end of the rod,

(d) a tubular metallic bellows surrounding said contact rod and having axially opposed inner and outer ends and inner and outer diameters, the bellows including a plurality of annular convolutions located at its inner diameter and at spaced locations along its length,

(e) means for joining the inner end of the bellows in sealed relationship to said contact rod, and means for joining the



outer end of the bellows in sealed relationship to said end plate,

(f) guide structure lining said central opening, fixed to said end plate, and located outside said convolutions of said tubular bellows,

(g) a sleeve of a material having a high degree of lubricity surrounding said contact rod and fixed thereto, said sleeve being disposed within said guide structure and within said tubular bellows, the sleeve fitting closely within said convolutions of the bellows so that the convolutions are capable of bearing against said sleeve to assist in guiding said rod, and

(h) said guide structure closely surrounding said sleeve and cooperating therewith for guiding said rod.

4,492,838

KEY SWITCH HAVING AN ACTUATOR INTEGRAL WITH THE RETURN SPRING

Kazutoyo Fukukura, Reading, Mass., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 24, 1983, Ser. No. 469,331

Int. Cl.[3] H01H 1/06

U.S. Cl. 200—159 A **6 Claims**

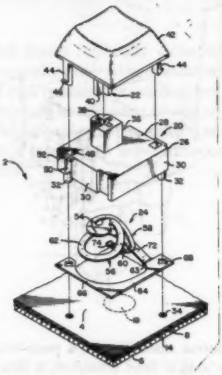
1. A key switch assembly of the type comprising a plunger, a return spring, and an actuator, the plunger being movable from an extended position to a depressed position with accompanying flexure of the return spring, the actuator being normally spaced from a switch contact zone and being movable against the contact zone in response to movement of the plunger from the extended position to the depressed position thereby to change the condition of the switch, the return spring being effective to return the plunger to the extended position with accompanying movement of the actuator away from the contact zone, the return spring and the actuator being provided as a one-piece member, the key switch assembly being characterized in that:

the one-piece member has a force-receiving portion which is in engagement with the plunger,

the return spring extends away from the force-receiving portion along a spiral path to a reaction portion which bears against a fixed support that is proximate to the switch contact zone,

the actuator extends away from the force-receiving portion towards the reaction portion, the actuator having a free end and having a contact portion on the free end which is engageable with the switch contact zone, the contact portion being between the force-receiving portion and the reaction portion when the plunger is in its extended position,

the return spring extending along a first spiral path from the



force-receiving portion, the radius of the first spiral path increasing along at least a portion of the first spiral path, the actuator extending along a second spiral path from the force-receiving portion to a reversed portion adjacent to its free end,

the actuator being entirely between adjacent turns of the return spring whereby

upon movement of the plunger from the extended position to the depressed position, the return spring is resiliently flexed and the contact portion of the actuator is moved against the contact zone thereby to change the condition of the switch.

4,492,839

THERMAL TREATMENT APPARATUS

Donald P. Smith, P.O. Box 340530, Dallas, Tex. 75234

Continuation-in-part of Ser. No. 177,174, Aug. 11, 1980, abandoned, and Ser. No. 341,640, Jan. 22, 1982, which is a continuation-in-part of Ser. No. 286,060, Jul. 22, 1981, Pat. No. 4,409,453, which is a continuation of Ser. No. 20,968, Mar. 16, 1979, abandoned, which is a division of Ser. No. 687,982, May 19, 1976, Pat. No. 4,154,861, said Ser. No. 177,174, is a continuation of Ser. No. 38,129, May 11, 1979, abandoned. This application Aug. 13, 1982, Ser. No. 407,943

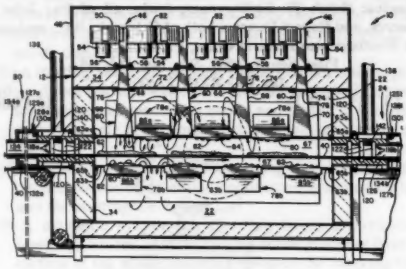
Int. Cl.[3] H05B 9/06

U.S. Cl. 219—10.55 R **14 Claims**

1. Apparatus for thermally treating food products, said apparatus comprising:

a heating section comprising means for supporting a food product; at least one microwave heating means; at least one impingement heating means, said impingement heating means further comprising a plurality of jet fingers adapted to direct a plurality of columnated jets of a temperature controlled gaseous fluid in substantially perpendicular relation against the surface of the food product; and means within the heating section for controlling the equilibrium relative humidity at the surface of the food

product so as to avoid localized overheating and over-browning of the food product; and



means for alternately imparting thermal energy to said food products from said microwave heating means and from said impingement heating means.

4,492,840

APPARATUS FOR INDUCTIVELY HEATING METALLIC MEDICAL AND DENTAL TOOLS

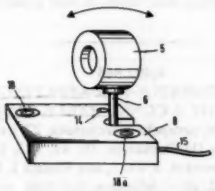
August Lex, Entermühlstr. 3, 8221 Grabenstätt, Fed. Rep. of Germany

Filed Jun. 25, 1982, Ser. No. 392,150

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1980, 3007982

Int. Cl.³ H05B 6/14; A61C 19/00

U.S. Cl. 219—10.57 **6 Claims**



1. In an apparatus for heating metallic medical and dental laboratory tools, instruments and implements by means of exposure to a high frequency electrical field and including an electrically conductive induction coil embedded in an insulator with an annular cavity formed therewithin, said apparatus further comprising:

(a) said induction coil being pivotally secured to a stationary base by means of a pivot arm linkage;

(b) a light emitting diode for indicating the operational status of a circuit providing power to said induction coil is visibly mounted on the outer surface of said stationary base;

(c) said induction coil being arranged for mechanical and electrical coupling to a source of alternating current power; and

(d) a photosensitive switching circuit and mechanism being provided for controlling the energization of said alternating current power source, said photosensitive switching circuit and mechanism including two photoresistive elements with the first of said photoresistive elements being installed within said stationary base such that it continues to be exposed to light when work is introduced into the confines of said induction coil, and with the second of said photoresistive elements being installed within said stationary base and adjacent said annular cavity such that it is at least partially obstructed from light when work is introduced and present in the confines of said induction coil.

4,492,841

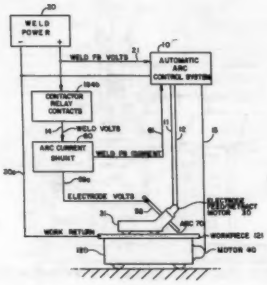
CONSTANT POTENTIAL/CONSTANT CURRENT AUTOMATIC CONTROL SYSTEM FOR AIR-CARBON ARC METAL REMOVAL

Henry B. Delius, Lancaster, Ohio, assignor to Arcair Company, Lancaster, Ohio

Filed Apr. 18, 1983, Ser. No. 485,804

Int. Cl.³ B23K 9/10

U.S. Cl. 219—69 R **22 Claims**



1. A control system which senses arc current and arc voltage and controls the feed of a carbon electrode in an air-carbon arc metal removal system having arc power produced by either a constant potential power source or a constant current power source comprising:

means for sensing the magnitude of the arc current and providing an arc current command signal;

means for sensing the magnitude of the arc voltage and providing an arc voltage command signal;

feedback control means for controlling the feed of the carbon electrode toward and away from a workpiece in accordance with an applied input signal; and

switching means for alternately applying as said input signal to said feedback means (1) said arc current command signal when said constant potential source provides weld power thereby to maintain the arc current at a predetermined value, or (2) said arc voltage command signal when said constant current source provides weld power thereby to maintain the arc voltage at a predetermined value.

4,492,842

PROCESS OF BRAZING USING LOW TEMPERATURE BRAZE ALLOY OF GOLD-INDIUM TIN

Nicholas G. Koopman, Hopewell Junction, and Vincent C. Marcotte, Lagrangeville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 8, 1983, Ser. No. 521,286

Int. Cl.³ C22C 5/02

U.S. Cl. 219—85 M **7 Claims**

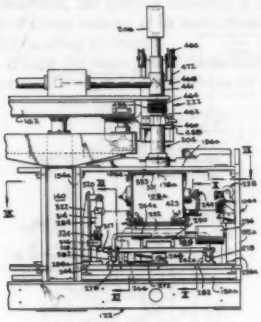
1. In a process for joining chips to a nickel-plated circuit on the surface of a multi-layer ceramic structure at a temperature of about 300° to 360° C. wherein brazed joints are provided prior to said joining, the improvement which comprises forming said braze joints with a brazing alloy consisting essentially of gold, indium and tin, said brazing alloy not undergoing even partial melting at a temperature below about 360° C.

4,492,843

APPARATUS AND METHOD FOR LASER MACHINING IN A NON-REACTIVE ENVIRONMENT

Richard A. Miller, North Huntingdon, and Gerald G. Lessman, Pleasant Hills Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1982, Ser. No. 414,242
Int. Cl.³ B23K 27/00
U.S. Cl. 219—121 LC 30 Claims



1. Welding apparaus for providing a welding environment about a work piece to be welded, the welding environment being of a substantially pure non-reactive gas and substantially free of any gas reactive to the material of the work piece, said welding apparatus comprising:

(a) a welding chamber for receiving the work piece and for establishing the welding environment about the work piece, said welding chamber having an input port means disposed at a bottom portion thereof and output port means disposed at a top portion of said welding chamber, the remainder of said welding chamber defining a gas tight chamber for preventing the exchange of the non-reactive gas within the said welding chamber and any reactive gas outside of said welding chamber;

(b) means coupled to said input port means for providing the non-reactive gas at a controlled flow rate into said bottom portion of said welding chamber, said non-reactive gas having a high density relative to any reactive gas to be evacuated from said welding chamber; and

(c) diffuser means disposed at the bottom portion of said welding chamber in operative relation to said input port means for distributing the non-reactive gas substantially evenly over the cross section of said welding chamber, whereby a uniform, laminar flow of the non-reactive gas is formed about the work piece and any reactive gas is aspirated from said welding chamber through said output port means; and

wherein said diffuser means is disposed across a portion of the cross sectional area of said welding chambers sufficient to establish the desired laminar flow of the non-reactive gas about the work piece,

wherein there is further included means for mounting the work piece within said welding chamber intermediate said input port means and said output port means,

wherein there is included means for generating and forming a welding beam, and means for moving said mounting means and the work piece mounted thereby with respect to the welding beam, and

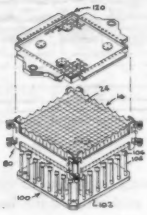
wherein there is further included second input port means associated with said mounting means and said flow providing means, whereby said flow providing means directs a second controlled flow of the non-reactive gas into an intermediated portion of said welding chamber and about said mounting means and the work piece.

4,492,844

WELDING PLATES FOR A FUEL ROD GRID

Richard M. Kobuck, Delmont; Richard A. Miller, North Huntingdon; Ralph W. Kalkbrenner, Irwin, all of Pa.; John S. Kerrey, and Robert Duncan, both of Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1982, Ser. No. 414,265
Int. Cl.³ B23K 27/00
U.S. Cl. 219—121 LC 16 Claims



1. A vane side welding plate for use in welding the vane side of a grid comprising sets of spaced, parallel and slotted straps, said straps of one set being substantially perpendicular to the straps of the other set, and the straps of each set intersecting and entering the slots of the straps of the other set, said straps having on one side of said grid resilient vanes extending at a small angle to the strap from which it extends and resiliently urged to a larger angle, said welding plate comprising:

i. means for holding the straps of each set closely parallel and for holding the straps of one set closely perpendicular to the straps of the other set, and

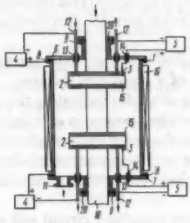
ii. means for holding said vanes at said small angle to said straps.

4,492,845

PLASMA ARC APPARATUS FOR APPLYING COATINGS BY MEANS OF A CONSUMABLE CATHODE

Gennady V. Kljuchko, prospekt Kurchatova, 27, kv. 68; Valentin G. Padalka, ulitsa Danilevskogo, 10, kv. 122; Leonid P. Sablev, ulitsa P. Morozova, 3, kv. 3, and Rimma I. Stupak, ulitsa Valtera, 12, kv. 32, all of Kharkov, U.S.S.R.

Filed Sep. 9, 1982, Ser. No. 416,310
Int. Cl.³ B23K 9/00; C23C 15/00
U.S. Cl. 219—121 P 14 Claims



1. A plasma arc apparatus for applying coatings comprising:

(a) a working anode chamber of a non-magnetic metal, made in the form of a pipe of a uniform cross-section having a predetermined axial length and intended for work to be disposed therein and to be subjected to a plasma spraying process;

(b) an annular consumable cathode having a central opening for work to be installed therewithin in a working position within said working anode chamber and having a cross-sectional configuration, which substantially coincides

with the cross-sectional configuration of said pipe which forms said chamber, said cathode being disposed within the latter in coaxial relationship therewith and having a lateral evaporation surface that faces said anode chamber and is of an axial length less than the axial length of the anode chamber;

(c) a starting electrode serving to start an arc discharge;

(d) a direct current source for feeding electrical power to form an arc between said anode and cathode, said direct current source being connected with said anode and cathode;

(e) a pulsed current source for starting the arc, said pulsed current source being initially connected with said cathode and the starting electrode;

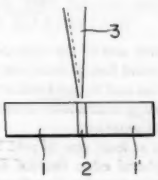
(f) a magnetic system for diverting charged particles of plasma produced in said working anode chamber from the surface of the anode chamber towards the working being treated, said system being mounted on the outer side of said pipe forming said working anode chamber.

4,492,846

PROCESS FOR THE PRODUCTION OF BONDED HARD ALLOYS

Akio Hara; Masaya Miyake, and Shuji Yazu, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 8, 1982, Ser. No. 433,533
Claims priority, application Japan, Oct. 15, 1981, 56-165440
Int. Cl.³ B23K 27/00
U.S. Cl. 219—121 LC **5 Claims**



1. A process for the production of bonded hard alloys, which comprises inserting a sheet of a material selected from the group consisting of an iron group metal and an alloy thereof as a filler metal between the surfaces, to be bonded, of at least one kind of hard alloy selected from the group consisting of carbides, nitrides, carbonitrides and carboxynitrides of Group 4a, 5a and 6a elements of the Periodic Table and solid solutions thereof, and applying a high energy beam to at least part of the sheet to melt and solidify the sheet in a slit form and thereby bond the hard alloys together.

4,492,847

MANIPULATOR WELDING APPARATUS WITH SENSING ARRANGEMENTS FOR WELD SLAM TRACKING

Ichiro Masaki, Utica, Mich.; Burt H. Shulman, Salt Point, N.Y., and Robert R. Gorman, Newtown, Conn., assignors to Unimation, Inc., Danbury, Conn.

Filed Sep. 30, 1981, Ser. No. 307,174
Int. Cl.³ B23K 9/12
U.S. Cl. 219—124.34 **6 Claims**

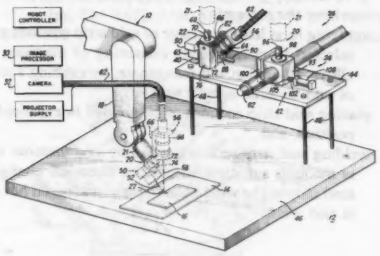
1. An image sensing arrangement for manipulator welding apparatus comprising:

sensing means including a projection source and an image sensing unit, the manipulator apparatus including a manipulator arm controllable in a plurality of axes and having a hand at one end of the arm, said sensing means being carried by the hand so as to be movable in said plurality of axes;

a generally elongated welding torch carried by the hand;

means for mounting said welding torch to the manipulator arm;

means for rotatably mounting said sensing means with respect to the hand and said welding torch, the axis of rotation of said sensing means being substantially perpendicular to the longitudinal axis defined by said welding torch; and



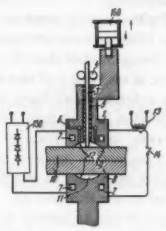
means for selectively rotating said sensing means between an operative sensing position and an inoperative position, said welding torch performing welding with said sensing means in said inoperative position, said welding torch being inoperative with said sensing means in said operative position.

4,492,848

SPOT ARC WELDING APPARATUS

Genrikhn Strekalou; Anatoly S. Shtyrin, both of Moscow; Viktor I. Matveen, Domddedova; Mikhail A. Maryanchik, and Genrikh S. Garibov, both of Moscow, all of U.S.S.R., assignors to Spetsialnoe Konstruktorsko-Tekhnologicheskoe Bjuro "Energostalproekt", Moscow, U.S.S.R.

Division of Ser. No. 213,386, Dec. 5, 1980, Pat. No. 4,396,821.
This application Mar. 30, 1983, Ser. No. 480,228
Int. Cl.³ B23K 9/00
U.S. Cl. 219—127 **19 Claims**



1. An apparatus for spot arc welding comprising:

a consumable electrode;

a pair of contact electrodes arranged opposite to each other, at least one of said contact electrodes having a central hole to accommodate said consumable electrode;

said contact electrodes each having surfaces contacting a workpiece to be welded and each being provided with a central concave portion whose shape corresponds to a calculated shape of weldment reinforcements at both sides of a planned spot welded joint; and

means associated with said contact electrodes for preheating thereof.

4,492,849

METHOD OF WELDING STEEL STRIP

Jack M. Biegay, Freeport, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed May 26, 1981, Ser. No. 267,176
Int. Cl.³ B23K *9/02, 20/24*
U.S. Cl. 219—137 WM 16 Claims

1. A method of autogenous welding sections of steel strip comprising the steps of:

applying to at least one edge of said strip sections a material selected from the group consisting of titanium, titanium alloys, aluminum and manganese, by rubbing a solid piece of said material against said edge,

placing said strip sections to be welded in a desired relative position, and

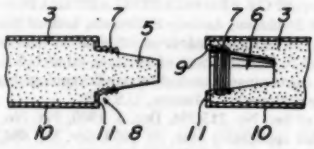
welding said strip sections, whereby said material is applied in amounts sufficient to effect a chemical change in said steel strip in the weld zone to resist undesired hot cracking in said weld.

4,492,850

CARBON ROD ASSEMBLY FOR ARC GOUGING AND BLASTING OF METALLIC ARTICLE

Haruo Yasuda, Ohgaki; Kunihiko Yoshida, Motosu; Yasuro Iwai, Ohgaki, and Takayuki Mizutani, Yoro, all of Japan, assignors to Ibiden Co., Ltd., Japan

Filed Feb. 26, 1982, Ser. No. 352,758
Claims priority, application Japan, Mar. 3, 1981, 56-29348
Int. Cl.³ B23K *35/04*
U.S. Cl. 219—145.21 8 Claims



1. A carbon rod assembly for arc gouging and blasting of a metallic article, comprising:

a first carbon rod piece having a substantially frusto-conical axial projection formed at one end thereof, the diameter of said projection being smaller than the diameter of said first carbon rod piece at said one end thereof and decreasing as said projection extends away from said first carbon rod piece, said projection having from one-half to three turns of external screw threads formed on a foot portion thereof, and a conductive metallic coating continuously covering the outer periphery of said first carbon rod piece and said external screw threads; and

a second carbon rod piece having a frusto-conical axial socket hole formed at an open end thereof, the diameter of said socket hole being smaller than the diameter of said second carbon rod piece, said socket hole having from one-half to three turns of internal screw threads formed adjacent said open end portion thereof, and a conductive metallic coating continuously covering the outer periphery of said second carbon rod piece and said internal screw threads;

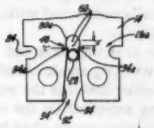
wherein said substantially frusto-conical axial projection and said frusto-conical axial socket hole have the same taper, the axial length of said projection being smaller than the axial depth of said socket hole, whereby said first and second carbon rod pieces are adapted to be firmly joined together by inserting said projection into said socket hole and rotating said carbon pieces relative to each other.

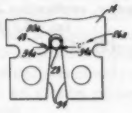
4,492,851

SWAP ACTION ARRANGEMENT MOUNTING AN ELECTRIC DEFROSTER HEATER TO A FINNED REFRIGERATION UNIT

Charles R. Carr, Manitou Beach, Mich., assignor to Brazeway, Inc., Adrian, Mich.

Continuation-in-part of Ser. No. 221,126, Dec. 29, 1980, abandoned. This application Aug. 25, 1982, Ser. No. 411,219
Int. Cl.³ H05B *3/40;* F25D *21/08;* F28F *1/30*
U.S. Cl. 219—201 2 Claims





1. A refrigeration unit of the type comprising a plurality of spaced, parallel, metal fins, at least one refrigerant tube extending through the fins and in mechanical engagement therewith, and a rod-like heating element for defrosting said unit, wherein the improvement comprises:

an entry slot in at least one of said fins extending inwardly from a peripheral edge thereof and through which said heating element may be introduced into said fin;

said entry slot being inwardly tapered to define a narrowed deformable throat at the inner end of said slot, said throat being defined by a pair of opposing edges of said cutout, said edges being spaced apart a distance marginally less that the outside cross sectional dimension of said heating element thereby to present resistance to the passage of said heating element through said throat; and

a notch in said fin communicating with said throat and within which said heating element is normally held, said notch having a first dimension parallel to said entry slot which is substantially greater that the diameter of said heating element and a second dimension transverse to said entry slot which is substantially equal to the diameter of the heating element to allow said heating element to clear said throat upon insertion of said heating element into said notch but to be firmly held in said notch.

4,492,852

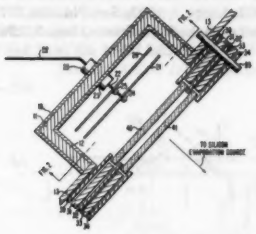
GROWTH SUBSTRATE HEATING ARRANGEMENT FOR UHV SILICON MBE

Sean N. Finegan, Aberdeen; James H. McFee, East Windsor, and Robert G. Swartz, Highlands, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 11, 1983, Ser. No. 465,800
Int. Cl.³ H05B *1/00;* H01L *21/20*
U.S. Cl. 219—405 6 Claims

1. In an evacuable chamber adapted for use in a molecular beam epitaxy system, a substrate heating arrangement including filament means responsive to an applied current for generating thermal energy, container means for forming an enclosure around said filament means, said container means includ-

ing an aperture on at least one surface, first and second semiconductor substrates, said first semiconductor substrate regulating the temperature on the surface of said second semiconductor substrate to be not greater than a predetermined temperature for any current applied to said filament means, siad



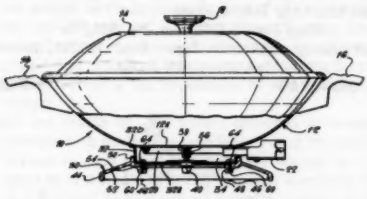
second semiconductor substrate being a growth substrate, and substrate support means for holding said first and second substrates in a substantially parallel, spaced-apart relationship with respect to each other, said substrate support means being mounted to said container means at said aperture.

4,492,853

ELECTRICALLY HEATED COOKING OR FOOD HEATING DEVICES

Yanta Lam, Kowloon, Hong Kong, assignor to Meyer Manufacturing Company, Limited, Kwun Tong, Hong Kong

Filed Jun. 8, 1983, Ser. No. 502,314
Int. Cl.³ F27D *11/02*
U.S. Cl. 219—432 **5 Claims**



1. An electrically heated cooking or food heating device comprising

a metal food container having a base and upstanding sides,

a sheathed electrical heating element attached to the underside of the base for heating food in the container, said heating element having terminal connections,

a stud fixed to the approximate centre of the underside of the base and extending downwardly therefrom,

a pan-shaped metal cover defining with the underside of said base an enclosed region for the electrical heating element,

a central hole through that cover,

a locking device extending through said central hole and fixed to said stud to hold said cover in place, and

a stand of synthetic plastics material attached to the underside of said cover, said stand comprising:

a circular ring having an outer periphery and an inner periphery,

a downwardly depending flange approximately at the outer periphery, said downwardly depending flange having a lower edge for supporting said device on a flat surface, a portion adjacent said inner periphery on which the underside of said cover rests,

means for joining said cover to said stand, and

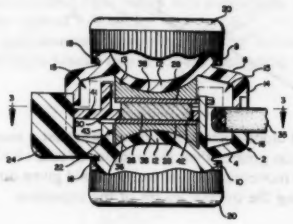
an intermediate upstanding circular flange defining a central open-topped bowl-shaped region in which the lower end and base of said pan-shaped cover is positioned.

4,492,854

CONTACT LENS DISINFECTOR

Francis E. Ryder, and Scott Ryder, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed Nov. 15, 1983, Ser. No. 552,170
Int. Cl.³ A61L *2/04*; H05B *1/02*
U.S. Cl. 219—521 **11 Claims**



1. A contact lens disinfector comprising: a casing formed from an electrically insulative material and defining a pair of wells at opposite ends thereof for receiving contact lenses and a quantity of disinfecting solution, each well opening to an end surface of the casing, and removable cover means attachable to said casing at each end thereof to overlie the associated well opening, each said well having an arcuately shaped end wall opposite to said end surface, a pair of metallic heat sink elements in said casing exterior of said wells and each heat sink element having a surface disposed against an associated end wall surface, electrical heater means intermediate said heat sink elements and in heat conductive engagement with said heat sink elements for supplying heat to each heat sink element, said heater means being of a type having an electrical resistance that increases upon increases of temperature above a predetermined temperature to limit the maximum operating temperature of the heater means, power supply leads in electrical circuit-forming relation with said heater means and extending from said heater means to the exterior of said casing for connection to a source of power, the surface of each end wall and the associated heat sink element disposed thereagainst being of similar arcuate configuration for conformable engagement to provide intimate surface-to-surface contact between each heat sink element and its associated end wall.

4,492,855

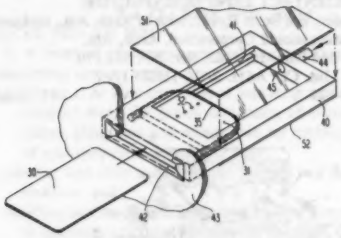
BADGE READER WITH IMPROVED SLIDE ARRANGEMENT

John S. Garczynski, Norristown; Frank J. Reed, Philadelphia; Jeffrey C. Hahn, and John J. Dobson, both of Oreland, all of Pa., assignors to Peripheral Dynamics, Inc., Plymouth Meeting, Pa.

Filed Jul. 9, 1982, Ser. No. 396,936
Int. Cl.³ G06K *7/10*
U.S. Cl. 235—458 **22 Claims**

1. Apparatus for reading a data encoded badge, comprising a channel for receiving said badge within said apparatus, said channel permitting said badge to move within it, an opaque slide having a given number of transparent clock-holes therein and adapted to be moved within said channel, paired optical source and detector means disposed on opposite sides of said slide for generating clock signals to detect movement of said clock-holes there between, means for maintaining said badge and said slide in abutting relation while said badge is being moved in a given direction within said apparatus, and means for reading data from said badge while said badge is moved in said given direction, said reading means incorporating means for utilizing said clock signals for synchronizing said data

reading with the movement of said clock-holes, wherein plural pairs of optical source and detector means are provided to detect movement of given clock-holes there between and



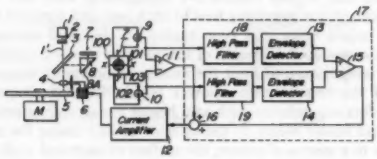
generate plural clock-signals therefrom such that a number of said clock signals greater than the number of said clock-holes is generated by movement of said badge in said given direction, thereby reducing the overall length of the apparatus.

4,492,856

APPARATUS FOR EFFECTING FOCUS CONTROL FOR USE IN OPTICAL DISC PLAYER

Kenji Kimura, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed May 5, 1982, Ser. No. 375,305
Claims priority, application Japan, May 14, 1981, 56-71341
Int. Cl.³ G01J *1/20*
U.S. Cl. 250—201 **6 Claims**



1. An apparatus for effecting a focus control for use in an optical disc player in which a light beam is projected onto an information track having a crenellated pit construction recorded on an optical disc as a light spot and a light beam modulated by said pit construction is made incident upon photoelectric converting means to produce an information signal, comprising:

means for introducing at least a part of said modulated light beam onto a photodetector having a plurality of light receiving regions divided in a given direction;

means for deriving a difference between output signals from said light receiving regions to produce a first focus information signal on a basis of a variation in amount of the light beam impinging upon the light receiving regions;

means for detecting, from the output signals of said plurality of light receiving regions of the photodetector, signal components modulated by the pit construction;

means for deriving a difference between said signal components to produce a second focus information signal on a basis of a variation in level of the signal components;

means for mixing said first and second focus information signals to produce a composite focus information signal; and

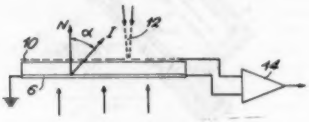
means for effecting a focus control in response to said composite focus information signal to maintain the light spot focused on the optical disc.

4,492,857

PYROELECTRIC DETECTOR AND VIDICON

Marie-Thérèse Averbuch, Meylan; André Durif-Varambon, Varges; Sylviane Gauthier, Grenoble; Ion F. Nicolau, Saint Nazaire les Eymes, and Jean C. Peuzin, Eybens, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 7, 1982, Ser. No. 415,702
Claims priority, application France, Sep. 9, 1981, 81 17075
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—211 R **8 Claims**



1. A pyroelectric radiation detector comprising a dielectric material inserted between two parallel electrodes, said material being a monodomain ferroelectric monocrystal having a polar axis, wherein the said material is ammonium phosphotellurate of chemical formula:

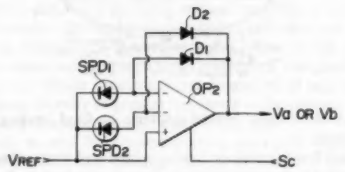
$$Te(OH)_6, 2[NH_4H_2PO_4], [(NH_4)_2HPO_4].$$

4,492,858

PHOTOMETRIC CIRCUIT HAVING A PLURALITY OF PHOTOELECTRIC TRANSDUCER ELEMENTS CAPABLE OF BEING SELECTIVELY ENABLED FOR PHOTOMETRY

Kazunori Mizokami, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1982, Ser. No. 385,778
Claims priority, application Japan, Sep. 11, 1981, 56-144118
Int. Cl.³ G03B *7/083*
U.S. Cl. 250—214 P **10 Claims**



1. A photometic circuit having a plurality of photoelectric transducer elements each capable of being selectively enabled for photometry, comprising:

a first operational amplifier including a plurality of differential amplifiers, each differential amplifier having a pair of input terminals and an output terminal, the pairs of input terminals of each of said differential amplifiers respectively defining a set of inverting and non-inverting input terminals of the operational amplifier and the output terminals of said differential amplifiers being coupled in common and defining the output of the operational amplifier;

a constant current bias circit for selectively supplying one of said differential amplifiers with a constant bias current, and a bias control switching circuit which selectively connects the constant bias current circuit to the differential amplifier selected by the bias control switching circuit in response to an external control signal applied at a control input of the operational amplifier; and

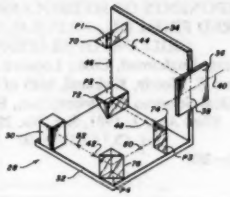
each of said photoelectric transducer elements being respectively connected across a pair of input terminals of each of said differential amplifiers.

4,492,859

DUAL AXES MULTIPLE PRISM OPTICAL SYSTEM FOR AZIMUTH AND ELEVATION VARIATION DETECTION

Anthony S. Pruszenski, Jr., Newbury, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Nov. 30, 1982, Ser. No. 445,556
Int. Cl.³ G01C 1/02
U.S. Cl. 250—216 8 Claims



1. A dual axes multiple prism optical system, comprising:

first and second 45°–90° prisms mounted in spaced apart relation with the hypotenuse face of each in planes nearly normal to each other and mutually normal to a first plane such that a ray of light at a predetermined wavelength in a direction selected to establish a reference is incident to the normal of the hypotenuse face of said first prism at the critical angle for said light at said predetermined wavelength and is deviated therefrom by total internal reflection in the direction of said second prism and is incident to the normal of the hypotenuse face of said second prism at the critical angle and is deviated therefrom by total internal reflection, any deviation of said ray in a plane parallel to said first plane causing opposite variations in reflection and refraction at the hypotenuse of said first and second prisms;

third and fourth 45°–90° prisms mounted in spaced apart relation with the hypotenuse face of each in planes nearly normal to each other and mutually normal to a second plane such that said ray of light totally internally reflected and deviated by said second prism is incident to the normal of the hypotenuse face of said third prism at the critical angle and is totally internally reflected therefrom in the direction of said fourth prism and is incident to the normal of the hypotenuse face of said fourth prism at the critical angle and is totally internally reflected therethrough, any deviation of said ray in a plane parallel to said second plane causing opposite variations in reflection and refraction at the hypotenuse face of said third and fourth prisms; and

means associated with each of said prisms for providing a signal indication of light refracted through the hypotenuse faces of corresponding ones of said prisms.

4,492,860

OPTICAL MEASURING DEVICE WITH MEANS FOR SUPPRESSING REFLECTIONS

Torgny Brogardh; Anders Linge, and Lars Sander, all of Västerås, all of Sweden, assignors to Asea Aktiebolag, Västerås, Sweden

Filed Nov. 30, 1981, Ser. No. 326,057
Claims priority, application Sweden, Dec. 1, 1980, 8008423
Int. Cl.³ G02B 5/14
U.S. Cl. 250—227 10 Claims

1. An optical measuring device for measuring a physical quantity, comprising:

a light source means adapted to generate incident light,

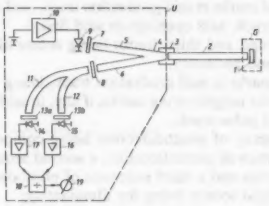
a measuring transducer exposed to the quantity to be measured and responsive to the incident light and able to modify the latter in response to changes in the quantity to be measured,

photo-detector means to respond to light coming from said measuring transducer and to produce electrical signals therefrom,

electronic means to process said signals and produce an output indicative of the quantity to be measured,

a light-transmitting system comprising a single optical fiber, the means for coupling incident light into said single fiber and modified light out of said single fiber consisting of a fiber optical Y-branch,

said light-transmitting system feeding incident light from said light source means to said measuring transducer and



feeding modified light from said measuring transducer to said photo-detector means,

a first element for polarizing the incident light entering said light-transmitting system from said light source means, and a second element for polarizing the light fed to the photo-detector means,

the difference in the direction of polarization between the two polarizing elements being chosen so that a direct path for light from said light source means to said photo-detector means via reflections in said light-transmitting system in and adjacent to the photo-detector means are substantially blocked from said photo-detector means by said second polarizing element, thus preventing said reflected signal from interfering with the measurement result, thus light polarized in one direction, and being reflected, being blocked in a polarizing device for polarization in another direction.

4,492,861

ARRANGEMENT FOR DETECTING THE POSITION OF AN INDEX MARK RELATIVE TO A GRADUATION

Franz Kebschull, 150, W.-Pieck-Str., Radeberg, District of Dresden, German Democratic Rep., and Ehrhardt Seidenschnur, H.-Matern-Str., 9, Jena-Lobeda, District of Gera, German Democratic Rep.

Filed Mar. 24, 1982, Ser. No. 358,193
Claims priority, application German Democratic Rep., May 29, 1981, 230392
Int. Cl.³ H01S 3/14
U.S. Cl. 250—237 G 7 Claims

1. An arrangement for detecting the position of an index line relative to a graduation, particularly for use in angle measuring devices,

comprising subsequent to a light source emitting a beam and being illuminated by said beam,

a graduation carrier means defining a first plane,

a mask defining a second plane,

an array of photodetectors defining a third plane,

said first, second and third plane being substantially in parallel to one another and substantially at right angles to said beam,

said graduation carrier means and said mask, said mask

and said array of photodetectors, respectively, being separated from one another by a narrow space,

a graduation track having a definite number of marks for defining the degree values of said measuring device,

the intervals between neighbouring graduation marks being equal,

a code track having a definite number of marks for encoding said degree values of respective graduation marks in said graduation track,

a pulse track, having a definite number of regularly arranged and spaced marks,

said graduation track, said code track, and said pulse track being provided on a transparent portion of said graduation carrier means in parallel to one another substantially in said first plane,

said mask having a first track of openings, a second track of openings and a third track of openings,

said marks in said pulse track,

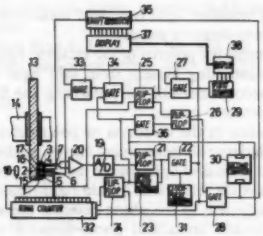
said marks in said graduation track, said marks in said code track, said openings in said first,

second and third tracks being substantially of equal size and geometry,

said marks in said graduation track, being vertically aligned to the neighbouring marks, if any, in said code track and in said pulse track,

said array of photodetectors being composed of a first sequence of photodetectors, a second sequence of photodetectors and a third sequence of photodetectors,

said light source being for illuminating:



said first sequence of photodetectors through said first track and said graduation track,

said second sequence of photodetectors through said second track and said code track,

said third sequence of photodetectors through said third track and said pulse track, the number of photodetectors in the sequences being defined by the number of openings in the associated first, second and third track, respectively,

said mask having a virtual central line being identical to said index line, and being substantially at right angles to the first, second and third track,

said first track having a first or start opening in said central line and further nine openings to the right for subdividing the interval between two adjacent degree marks into decidegree units,

said second track being ten openings to the left considered from said central line and eight openings to the right,

said third track having at least two openings symmetrically relative to said central line, said two openings being laterally displaced relative to the openings in said second track,

a ring counter,

said third sequence of photodetectors feeding a starting pulse into said ring counter via circuit elements when said virtual or index line is exactly between said two openings of said third track,

said ring counter being connected to said first and second sequence of photodetectors,

said ring counter having at least a same number of bit positions as said second track of said mask has openings, each photodetector of said first and second sequence of photodetectors being connected via its input to a bit position of said ring counter,

the photodetector of said second sequence of photodetectors being connected to one another and to a storage of an output unit,

said starting pulse via said ring counter sampling said first sequence of photodetectors and feeding the sampling information to said output unit,

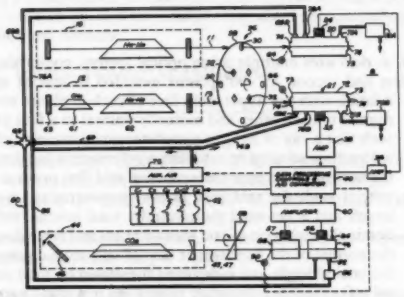
and sampling said second sequence of photodetectors and feeding the sampling information to said output unit.

4,492,862

METHOD AND APPARATUS FOR ANALYZING COMPONENTS OF HYDROCARBON GASES RECOVERED FROM OIL, NATURAL GAS AND COAL DRILLING OPERATIONS

Jack Grynberg, Englewood, Colo.; Leonard Y. Nelson, Seattle, and Stephen E. Moody, Kirkland, both of Wash., assignors to Mathematical Sciences Northwest, Inc., Bellevue, Wash.

Filed Aug. 7, 1981, Ser. No. 290,824
Int. Cl.³ G01V 5/00
U.S. Cl. 250—255 **88 Claims**



1. A method of determining the composition of hydrocarbon gases extracted during drilling operations, comprising the steps of:

(a) directing a first laser beam at a frequency strongly absorbed by methane gas and other hydrocarbon gases at a sample of the extracted gas;

(b) measuring the absorption of the first laser beam by the sample of gas;

(c) directing a second laser beam at the sample of gas at a frequency weakly absorbed by methane gas;

(d) measuring the absorption of the second laser beam by the sample of gas;

(e) calculating the concentration of methane gas present in the gas sample based on the absorption of the first and second laser beams by the sample of gas;

(f) directing a third laser beam at a sample of such gas at a frequency strongly absorbed by an additional type of hydrocarbon gas;

(g) measuring the absorption of the third laser beam; and

(h) calculating the concentration of the additional type of hydrocarbon gas present in the sample of gas based on the level of absorption of the third laser beam.

4,492,863

DETERMINING ELEMENTAL CONCENTRATIONS AND FORMATION MATRIX TYPE FROM NATURAL GAMMA RAY SPECTRAL LOGS

Harry D. Smith, Jr., Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

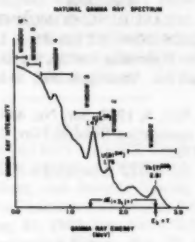
Filed Oct. 1, 1982, Ser. No. 432,203
Int. Cl.³ G01V 5/00
U.S. Cl. 250—256 **14 Claims**

1. A method of natural gamma ray spectral well logging to

determine the formation matrix type or lithology of earth formation penetrated by a well borehole, comprising the steps of:

passing a fluid tight hollow well logging sonde, sized and adapted for passage in a well borehole, through earth formations penetrated by a well borehole, said sonde containing a scintillation type radiation detector and an associated photomultiplier, and obtaining therefrom a gamma ray energy spectrum of naturally occurring gamma rays emitted by the earth formations;

separating said gamma ray energy spectrum into at least two separate energy regions, an upper energy region and a



lower energy region, said upper energy region being selected such that gamma radiation detected therein is comprised essentially of naturally occurring gamma rays attenuated primarily by Compton scattering in the earth formations and said lower energy region being selected such that gamma radiation detected therein is comprised essentially of naturally occurring gamma rays attenuated significantly by photoelectric absorption in the earth formations; and

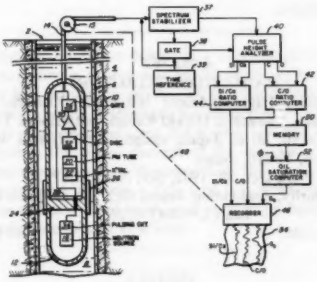
deriving from a function of the number of gamma rays occurring in said upper and lower energy regions an indicator of the lithology of the earth formation.

4,492,864

NEUTRON WELL LOGGING

Harry D. Smith, Jr., and Ward E. Schultz, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 31, 1981, Ser. No. 288,441
Int. Cl.³ G01V 5/10
U.S. Cl. 250—259 **8 Claims**



1. A method for determining the oil saturation of an earth formation of interest adjacent a well bore, comprising the steps of:

(a) irradiating the formation of interest with high energy neutrons;

(b) obtaining a measure of the relative presence of carbon and oxygen in the formation from inelastic scatter gamma rays returned from the irradiated formation;

(c) displacing the formation oil and water mixture from the formation of interest with a mutually soluble liquid;

(d) irradiating the formation a second time with high energy neutrons;

(e) obtaining a second measure of the relative presence of carbon and oxygen in the formation from inelastic scatter gamma rays returned from the formation containing the mutually soluble liquid;

(f) displacing the mutually soluble liquid from the formation of interest with water;

(g) irradiating the earth formation a third time with high energy neutrons;

(h) obtaining a third measure of the relative presence of carbon and oxygen from inelastic scatter gamma rays of the formation containing water;

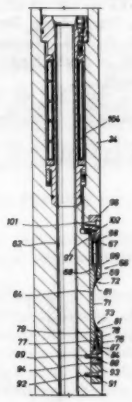
(i) determining from the three gamma ray measurements of carbon and oxygen the oil saturation of the formation of interest.

4,492,865

BOREHOLE INFLUX DETECTOR AND METHOD

Richard D. Murphy, and Daniel F. Coope, both of Houston, Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Feb. 4, 1982, Ser. No. 345,592
Int. Cl.³ G01V 5/12
U.S. Cl. 250—265 **31 Claims**



1. An apparatus for detecting the influx of formation fluids into a borehole and capable of being used in a drill string during a drilling operation, comprising:

a housing capable of being coupled in a drill string;

a radiation source means mounted on said housing;

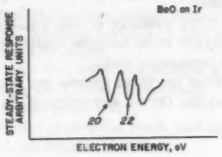
a radiation detection means spaced from said radiation source means on said housing, said detection means for detecting radiation from said source means which has substantially only passed through the fluids in said borehole.

4,492,866

METHOD FOR PREDICTING THE PERFORMANCE OF CATHODE MATERIALS

George A. Haas, Alexandria, Va.; Arnold Shih, Potomac, Md., and Christie R. K. Marrian, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 2, 1983, Ser. No. 490,994
Int. Cl.³ H01J 40/00, 47/00
U.S. Cl. 250—305 11 Claims



1. A method for predicting the suitability of various materials for use in fabricating cathodes comprising the steps of:

(a) preparing a plurality of samples having various concentrations of metal substrate materials,

(b) forming a surface layer on said samples with an alkaline earth compound,

(c) measuring the relative magnitudes of at least two adjacent interatomic Auger peaks for each sample,

(d) determining from said relative magnitudes the relative degree of charge transfer between the alkaline earth metal and oxygen atoms for each sample, and

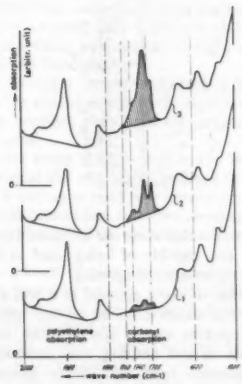
(e) comparing the relative degree of charge transfer of each sample with every other sample, whereby the suitability of the various materials for use in fabricating cathodes may be predicted.

4,492,867

METHOD OF AND APPARATUS FOR DETERMINING THE STATE OF AGEING OF PLASTIC PRODUCTS

Johannes J. Laarhoven, Hardenberg; Jan P. van Dongeren, Bergentheim; Hendrik de Wit, Wassenaar, and Louis M. Smeets, Amsterdam, all of Netherlands, assignors to Wavin B.V., Zwolle, Netherlands

Filed Jul. 14, 1982, Ser. No. 398,235
Claims priority, application Netherlands, Jul. 5, 1981, 8103468
Int. Cl.³ G01J 1/00
U.S. Cl. 250—341 16 Claims



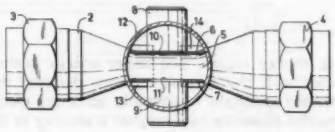
1. Method of determining the state of ageing of plastic products comprising the steps of passing infrared radiation through the product determining the absorption thereof in the material at a wavelength value selected at the spectral location where the chemical and/or physical change in the plastic created by ageing causes a change in absorption, performing a second measurement in a different wavelength area where the absorption value is independent of the state of ageing, and comparing the difference between the absorption value and the value of said second measurement to obtain a pre-adjusted calibration value as a criterion for determining the state of ageing.

4,492,868

DEVICE FOR MEASURING CONCENTRATION OF PARTICLES CONVEYED BY A LIQUID

Roland E. Jelvestam, Björnidegränd 29, S-163 64 Vällingby, and Pär-Halan Bergström, Vassvägen 5H, S-141 39 Huddinge, both of Sweden

Filed Nov. 4, 1982, Ser. No. 439,224
Claims priority, application Sweden, Nov. 25, 1981, 8107026; Nov. 25, 1981, 8107027
Int. Cl.³ G01J 5/54; G01N 21/84
U.S. Cl. 250—345 14 Claims



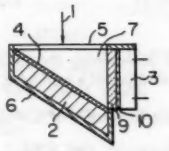
1. A measuring device for measuring the concentration of particles conveyed by a liquid through a tube and including measuring probes and a reference apparatus, each one of said measuring probes and reference apparatus including an emitter and a detector, comprising said emitter and said detector of the measuring probes are disposed in the wall of the tube axially in register with each other on either side of the liquid advanced through the tube and said emitter and detector of the reference apparatus are arranged on either side of a reference path being free from liquid and are of the IR type, said emitters being fed from a common source sending pulsed energy to the emitters, said energy having short energy pulses with relatively long time intervals between said pulses, said pulse being of a shorter duration than that of square wave pulses, and said reference apparatus is involved in an electronic circuit being temperature-compensated.

4,492,869

RADIATION DETECTOR

Atsushi Suzuki, Higashiyamato; Hiromichi Yamada, Hino; Yoko Uchida, Kawasaki; Hideki Kohno, and Minoru Yoshida, both of Tokyo, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Oct. 20, 1981, Ser. No. 313,171
Claims priority, application Japan, Oct. 22, 1980, 55-146891
Int. Cl.³ G01T 1/20
U.S. Cl. 250—367 67 Claims



1. A radiation detector comprising:

a housing having a window for introducing radiation therethrough from one direction;

a scintillator disposed within said housing, said scintillator including a layer of phosphor particles which emit radiation-stimulated light therefrom upon impingement of said radiation thereon;

a secondary radiation shielding layer disposed in a face of said housing located at a position deviated from a path of transmission of said radiation, said secondary radiation shielding layer being made of a material which has a high permeability with respect to the radiation-stimulated light emitted from said phosphor particle layer and a low permeability with respect to secondary radiation from said phosphor particle layer; and

a light detector for receiving the radiation-stimulated light emitted from said phosphor particle layer through said secondary radiation shielding layer.

4,492,870

ANGULAR LIMITATION DEVICE IN A CHARGED PARTICLE BEAM SYSTEM

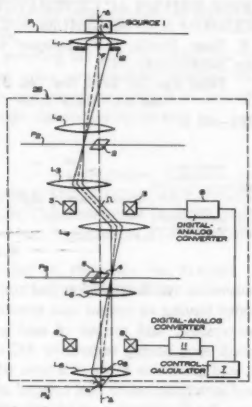
Emmanuel de Chambost, and Jacques Trotel, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 31, 1982, Ser. No. 413,524

Claims priority, application France, Sep. 22, 1981, 81 17846

Int. Cl.³ H01J *37/00*; A61K *27/02*

U.S. Cl. 250—398 **7 Claims**



1. An angular limitation device in a charged particle beam system comprising a source and an electronic optical system permitting the projection of the beam onto a target plane, wherein only a single diaphragm for the angular limitation of the beam is positioned between the source and the electronic optical system, the useful current of the beam at the target plane being more than one thousandth of the current emitted by the source and wherein a first lens is positioned between said source and said diaphragm, said diaphragm being located in the focal plane of said first lens.

4,492,871

METHOD FOR DETERMINING IMPURITIES IN EPITAXIAL SILICON CRYSTALS

Mickio Tajima, Ystabemachi, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Aug. 17, 1982, Ser. No. 408,908

Claims priority, application Japan, Oct. 7, 1981, 56-159727

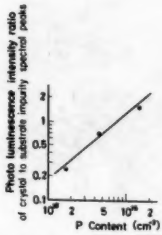
Int. Cl.³ G01N *21/64*

U.S. Cl. 250—459.1 **5 Claims**

1. A method for determining impurities within an epitaxial silicon crystal grown upon a silicon crystal substrate, comprising the steps of:

irradiating the surface of an epitaxial silicon crystal grown upon a silicon crystal substrate with a laser beam at the temperature of liquid helium so as to result in the emanation of luminescent light beams from said epitaxial silicon crystal and said silicon crystal substrate in response to the presence of impurities within said epitaxial silicon crystal and said silicon crystal substrate;

obtaining spectra of said luminescent light beams emanating from said epitaxial silicon crystal and said silicon crystal substrate; and



forming a relationship between the photo luminescence intensity ratio of the photo luminescence intensity of said luminescent light beam from said epitaxial silicon crystal to the photo luminescence intensity of said luminescent light beam from said silicon crystal substrate, as derived from said spectra of said luminescent light beams emanating from said epitaxial silicon crystal and said silicon crystal substrate, and the concentration of said impurity within said epitaxial silicon crystal, whereby the concentration of said impurity within said epitaxial silicon crystal may be determined from said relationship as a function of said photo luminescence intensity ratio.

4,492,872

ALBEDO DOSIMETER ENCAPSULATION

Bertram Burgkhart, Karlsruhe, Fed. Rep. of Germany; Gabor Hassib, Cairo, Egypt, and Ernst Piesch, Eggenstein-Leopoldshafen, Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 379,694

Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120373

Int. Cl.³ G01T *1/11*

U.S. Cl. 250—484.1 **9 Claims**

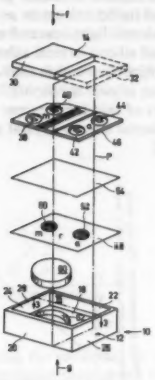
1. Albedo dosimeter encapsulation for measuring neutron and gamma radiation in at least two dosimeter zones, comprising:

(a) a casing having boron or cadmium containing walls which have neutron absorbing capability, said casing having a front side which faces a radiation field and a rear side which faces a body which carries the encapsulation, the rear side of the casing being closed by a cadmium or boron containing rear wall having a first portion and a second portion;

(b) a cover located at the front side of the casing, the cover having a cadmium or boron containing wall portion and a window portion; and

(c) the casing having a first zone for holding a first dosimeter means and a second zone for holding a second dosimeter means, for first zone being aligned with the cadmium or boron containing wall portion of the cover and the first portion of the rear wall, and the second zone being aligned with the window portion of the cover and the second portion of rear wall, the cadmium or boron containing wall portion of the cover having a neutron absorbing capability which is different from the neutron absorbing

capability of the first portion of the rear wall, and the first portion of the rear wall having a neutron absorbing capability which is different from the neutron absorbing capability of the second portion of the rear wall.



4,492,873

APPARATUS FOR ELECTRON BEAM IRRADIATION OF OBJECTS

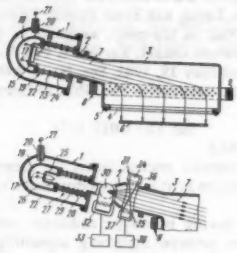
Stanislav P. Dmitriev, ulitsa Michurinskaya, 19, kv. 23; Andrei S. Ivanov, ulitsa Kuznetsovskaya, 8, kv. 33; Mikhail P. Svinin, poselok Metallostroi, ulitsa Bogaichuka, 4, kv. 25, and Mikhail T. Fedotov, poselok Metallostroi, ulitsa Polevaya, 22, kv. 58, all of Leningrad, U.S.S.R.

PCT No. PCT/SU80/00065, § 371 Date Dec. 21, 1981, § 102(e) Date Dec. 21, 1981, PCT Pub. No. WO81/03104, PCT Pub. Date Oct. 29, 1981

PCT Filed Apr. 25, 1980, Ser. No. 336,393

Int. Cl.³ H01J *33/02*

U.S. Cl. 250—492.3 **3 Claims**



1. An apparatus for an electron beam irradiation of objects, comprising an electron beam shaper and a deflecting electromagnet with a frame-type magnetic circuit to direct the electron beam onto an irradiated object substantially at an angle at 90°, characterized in that the electron beam shaper 1 is made such as to provide a ribbon-shaped electron beam 7, the deflecting electromagnet 8 having two-poles 10, 11, said poles extending over the whole width of the object 6, and comprises two windings 12, 13 embracing said poles 10, 11 and connected to a direct current source 14, the deflecting electromagnet 8 being arranged so that the trajectories of the electrons within the area from the shaper 1 to the deflecting electromagnet 8 are inclined to the plane of the frame of its magnetic circuit 9, and wherein the electron beam shaper 1 comprises an electron gun 15 with an extended cathode 16 and an accelerating tube 19 providing acceleration of the ribbon-shaped electron beam.

3. An apparatus for irradiation, comprising an electron beam shaper and a deflecting electromagnet with a frame-type magnetic circuit to direct the electron beam onto an irradiated object substantially at an angle of 90°, the electron beam shaper is made such as to provide a ribbon-shaped electron beam, and the deflecting electromagnet has two poles, said poles extending over the whole width of the irradiated object and comprises two windings connected to a direct current source, the deflecting electromagnet being arrangeed so that the trajectories of the electrons within the area from the shaper to the deflecting electromagnet are inclined to the plane of the frame of its magnetic circuit, characterized in that the electron beam shaper (1) comprises an electron beam (25) with a point cathode (26), an accelerating tube (27) and an electron beam sweeping electromagnet (30).

4,492,874

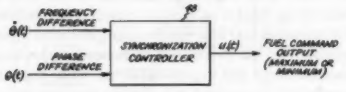
SYNCHRONIZATION FUEL CONTROL FOR GAS TURBINE-DRIVEN AC GENERATOR BY USE OF MAXIMUM AND MINIMUM FUEL SIGNALS

Timothy P. Near, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,881

Int. Cl.³ H02P *9/04*

U.S. Cl. 290—40 B **51 Claims**



1. An automatic synchronization fuel control for guiding an AC generator having an output into synchronization with an AC power system, said output of said generator and said power system each having respective AC voltages associated therewith, said generator being of a type which is driven by a turbine, said synchronization fuel control comprising:

first means for determining an instantaneous frequency difference and an instantaneous phase difference between said power system voltage and said generator output voltage;

second means for providing one of a first signal command for supplying a fixed predetermined minimum fuel flow to said turbine and a second signal command for supplying a fixed predetermined maximum fuel flow to said turbine;

said fixed predetermined maximum fuel flow being of a first value which is effective to produce a substantially constant acceleration of said generator, and said fixed predetermined minimum fuel flow being of a second value which is effective to produce a substantially constant deceleration of said generator;

third means for substantially continuously comparing said instantaneous frequency difference and said instantaneous phase difference; and

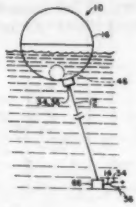
fourth means for determining, in accordance with predetermined functions, whether said second means should provide said first signal or said second signal, said predetermined functions being selected so as to guide said generator to an optimal synchronization point at which a predetermined frequency difference and a predetermined phase difference exist.

4,492,875

WAVE POWERED BUOY GENERATOR

Raymond A. Rowe, Encinitas, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 2, 1982, Ser. No. 446,284
Int. Cl.³ F03B 13/12
U.S. Cl. 290—53 18 Claims



1. A buoy generator comprising:

a hollow buoy having inner and outer surfaces;

at least one winding mounted to the buoy parallel to its surfaces, the winding having a pair of ends;

magnetized means freely disposed in all dimensions within the hollow buoy for unrestricted rolling on the inside surface of the hollow buoy whenever the hollow buoy has any rolling movement; and

means connected to the winding ends for rectifying current flow therefrom,

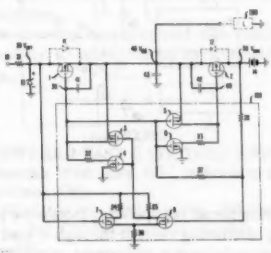
whereby, upon mooring the buoy in water, the flux lines of the magnetized roller means cut the winding when there is water motion and electrical current is provided by the winding through the rectifying means.

4,492,876

POWER SUPPLY SWITCHING ARRANGEMENT

Raymond O. Colbert, Oaklandon, and Bengt H. Hellman, Indianapolis, both of Ind., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 18, 1983, Ser. No. 514,596
Int. Cl.³ H02J 9/06
U.S. Cl. 307—66 11 Claims



1. Apparatus for interconnecting one of a plurality of voltage sources with a load comprising,

metal oxide semiconductor (MOS) transistor means, electrically in series with each of the voltage sources and the load, responsive to control signals for interconnecting the voltage sources with the load, only one of said voltage sources being interconnected at a time;

sequencing means, generating control signals for turning off all interconnecting MOS transistors when the voltage of the interconnected voltage source falls below a predetermined threshold level, and thereafter for enabling another of the voltage sources; and

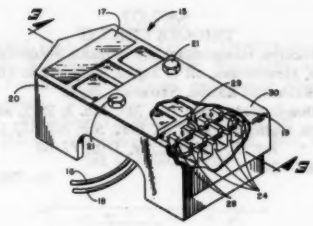
means for supplying voltage to the load during the time interval that all interconnecting MOS transistors are turned off.

4,492,877

ELECTRODE APPARATUS FOR CATHODIC PROTECTION

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jul. 26, 1982, Ser. No. 402,191
Int. Cl.³ H01B 7/28
U.S. Cl. 307—95 11 Claims



1. In a cathodic protection apparatus for a submersible metal unit subject to corrosion and including a submersible anode, a submersible reference electrode, and a current supply means connected between said anode and said metal unit and to said reference electrode to regulate the potential of said metal unit by maintaining the potential of said metal unit at a selected level relative to said reference electrode, the improvement comprising:

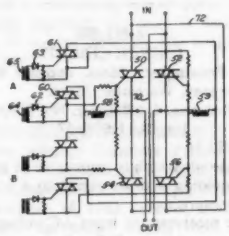
A metallic shield element mounted in close proximity to said reference electrode and said anode and connected to said metal unit to cause a first distance between said electrode and said anode to electrically simulate a second distance between said anode and a selected portion of said submersible metal unit, said second distance greater than said first distance, whereby said reference electrode can be mounted adjacent to said anode.

4,492,878

ELECTRICAL LINE REVERSAL AND PROTECTION SYSTEM

Howard L. Hamel, 67 Winthrop Rd., East Greenwich, R.I. 02818

Filed May 25, 1983, Ser. No. 498,020
Int. Cl.³ H02H 3/26
U.S. Cl. 307—127 3 Claims



1. An electrical apparatus connected between an alternating current supply and a load for the automatic reversal of the connection of supply lines to a load which has a near ground conductor comprising in combination an alternating current source and a load, said source and said load having at least a

ground wire and a pair of phase wires; a change-over switch means comprising two pairs of triacs with both anodes of each pair connected together to one phase wire, one of the other anodes of each pair being connected to a separate load phase wire; a logic circuit including a pair of three-terminal semiconductors, each with a control electrode and output electrode for operating the switch means; said control electrode connected to a phase wire for detecting a voltage change between one of the phase wires and the ground wire whereby when a voltage change is detected the output electrode will energize the gate of one triac of each pair to change the connection of said supply to said load.

4,492,879

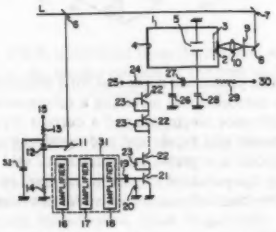
TRIGGER CIRCUIT

Yutaka Tsuchiya, Hamamatsu; Eiji Inuzuka, Shizuoka, and Yuji Shinoda, Hamamatsu, all of Japan, assignors to Hamamatsu Terebi Kabushiki Kaisha, Shizuoka, Japan

Continuation-in-part of Ser. No. 709, Jan. 3, 1979, abandoned. This application Oct. 16, 1981, Ser. No. 312,126

Int. Cl.³ H03K *5/04, 5/02, 17/60*

U.S. Cl. 307—248 **3 Claims**



1. In combination, an avalanche transistor and a trigger circuit responsive to trigger signals of variable intensity for driving said avalanche transistor into a conductive mode, said trigger signals having a frequency component, said trigger circuit comprising:

a first circuit stage receiving said trigger signals and comprising band pass amplifier means having an upper limit frequency much lower than the frequency component of the trigger signals to produce output signals which rise with a substantially constant ramp angle independent of waveforms of the trigger signals and,

a second circuit stage receiving output signals from said first circuit stage and comprising saturable amplifier means having a saturation voltage which is sufficiently low that said saturable amplifier means develops output signals having a substantially constant amplitude.

4,492,880

DRIVER CIRCUIT

Harold Weiss, Framingham, Mass., assignor to Parker Manufacturing Company, Worcester, Mass.

Filed Aug. 4, 1983, Ser. No. 520,412

Int. Cl.³ H03K *17/72*

U.S. Cl. 307—252 N **19 Claims**

1. A driver circuit which is responsive to an input AC line voltage for providing a drive signal to a load circuit, said driver circuit comprising:

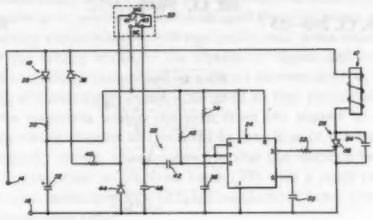
(a) means for receiving the input AC voltage;

(b) means for providing a DC voltage related to the input AC voltage;

(c) switch means connected to said DC voltage means, said switch means having first and second states;

(d) trigger means connected to said switch means, said trigger means charged to a voltage related to the DC voltage when said switch means is in said first state, said trigger means generating a triggering signal during such time that the input AC voltage is in a negative portion of its cycle and said switch means is in said second state;

(e) timing means responsive to said triggering signal for generating a control signal for a selected time period which is related to one cycle of the input AC voltage; and



(f) firing means responsive to said timing means for providing the drive signal to the load circuit, said firing means providing the drive signal when the control signal is applied to said firing means.

4,492,881

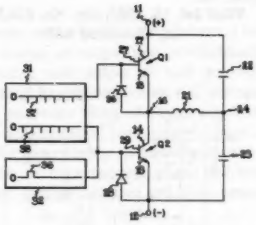
STORED CHARGE INVERTER CIRCUIT

Thomas E. Anderson, Avon, Conn.; Alvin A. Bush, and John Giorgis, both of South Euclid, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 184,648, Sep. 5, 1980, abandoned. This application Mar. 7, 1983, Ser. No. 472,681

Int. Cl.³ H03K *17/60, 3/33;* **H02M** *7/537*

U.S. Cl. 307—270 **14 Claims**

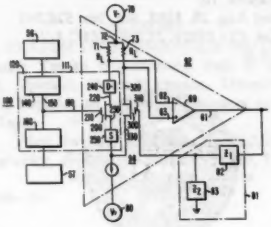


1. An inverter circuit for operating from a d-c power source and applying alternating current through a load which is inductive or has an inductive component, comprising two transistors connected to alternately apply current through said load from said power source, said transistors having the characteristic of storing a charge in their base-collector regions, and said load having the characteristic of inducing a fly-back current when current flow therein is terminated, wherein the improvement comprises means connected between said load and the base electrodes of respective ones of said transistors for applying the fly-back current resulting from each turn-off of one of said transistors through the base-collector path of the other of said tranistors for causing said other of said transitors to operate as an inverted transistor and rendering said other transistor conductive and storing a charge therein to keep it conductive for a period of time, said circuit being devoid of an external source of repetitive turn-on pulses for said transistors.

4,492,882
INTEGRATED CIRCUIT FOR CHIP OP/AMP INTERFACE

Arthur S. Jensen, and Keefer S. Stull, Jr., both of Baltimore, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 163,549, Jun. 27, 1980, Pat. No. 4,341,963. This application Jul. 26, 1982, Ser. No. 402,171
Int. Cl.³ G06G 7/12
U.S. Cl. 307—497 7 Claims

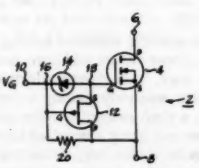


1. A circuit for coupling an electrical signal from an integrated circuit with portions of said circuit external said integrated circuit comprising:
an operational amplifier external to said integrated circuit having a first non-inverting input, a second inverting input and an output;
said integrated circuit including a semiconductor substrate;
differential amplifying means including first and second transistors, said first transistor in said substrate;
means in said substrate for coupling said first transistor to said electrical signal;
a feedback circuit;
said output of said operational amplifier coupled through said feedback circuit to said second transistor of said differential amplifying means;
said differential amplifying means having a first non-inverting output and a second inverting output;
said first non-inverting output of said differential amplifying means coupled to said non-inverting input of said operational amplifier;
said second inverting output of said differential amplifying means coupled to said inverting input of said operational amplifier.

4,492,883
UNPOWERED FAST GATE TURN-OFF FET

William J. Janutka, West Allis, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 21, 1982, Ser. No. 390,720
Int. Cl.³ H03K 17/04, 17/687
U.S. Cl. 307—571 11 Claims

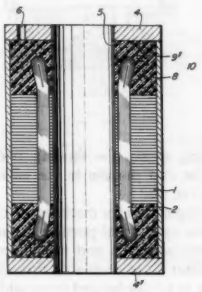


1. A fast turn-off FET circuit having drain, source and gate terminals, comprising:
an enhancement mode FET having a drain connected to said drain terminal, a source connected to said source terminal and a gate operatively coupled to said gate terminal;
a depletion mode JFET having a normally conductive ON state and connected to said FET gate and source and conductive upon turn-off of the latter due to removal of gate drive, conduction of said JFET providing faster discharge therethrough of residual stored charge on said FET gate, whereby to facilitate faster FET turn-off;
threshold voltage breakdown means connected between said gate terminal and said FET gate and having a greater breakover voltage than the pinch-off voltage of said JFET.

4,492,884
POROUS FILL STATOR OF A CANNED MOTOR

Etuo Asano, Sakura; Yasuro Suzuki, Narashino, and Nobuo Midou, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 22, 1982, Ser. No. 443,400
Claims priority, application Japan, Nov. 26, 1981, 56-188370
Int. Cl.³ H02K 1/04
U.S. Cl. 310—45 3 Claims



1. A canned motor comprising:
a stator including a cylindrical motor housing, a stator core having a stator winding mounted on an inner surface of said motor housing, a pair of end brackets each secured to one of two opposite open ends of said motor housing, and a cylindrical can arranged on an inner side of said stator core and secured at opposite ends to said end brackets;
a rotor mounted on an inner surface of said can; and
a porous insulator located in said stator and sealed by said motor housing, said end brackets and said can, said porous insulator is formed of an inorganic filler in particulate form having a grain size in a range of between 0.05 and 0.35 mm, and a resin having minute pores and connecting filler particles together, the resin is within a range of between 3–20 weight parts for 100 weight parts of the inorganic filler.

4,492,885
ALTERNATING CURRENT GENERATOR FOR A CAR

Yutaka Kitamura, Himeji; Yoshihisa Kitora, and Masatoshi Koyanagi, both of Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1982, Ser. No. 358,587
Claims priority, application Japan, Mar. 30, 1981, 56-47199[U]
Int. Cl.³ H02K 9/06
U.S. Cl. 310—62 8 Claims

1. An alternating current generator for a car comprising:
first and second brackets which respectively have a cup-like shape having a cylindrical portion and facing each other in the axial direction,
a rectifying device fixed to one of said brackets,

a stator held between said brackets,

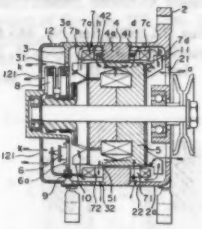
a rotor which is placed inside of said stator and is rotatably held by both of said brackets,

a first centrifugal fan fixed to one end of said rotor,

first ventilating means formed in the cupped end portion of one of said first and second brackets in the axial direction and on the side of said alternator having said first centrifugal fan, for feeding coolant air,

a second ventilating means formed in the cylindrical portion of said first bracket in which the first ventilating means is formed for discharging the coolant air,

a second centrifugal fan which is fixed to the other end of said rotor and which has an outer diameter larger than that of said first centrifugal fan and wherein said second centrifugal fan has a outer diameter greater than the inner diameter of said stator,



third ventilating means for feeding coolant air which is formed in the end portion in the axial direction of said second bracket, and

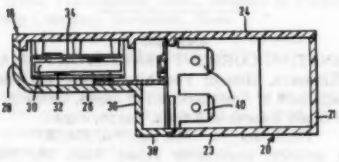
fourth ventilating means for discharging coolant air which is formed in the cylindrical portion of said second bracket, wherein when said first and second centrifugal fans are rotated, coolant air is ventilated through said third ventilating means to be discharged from said fourth ventilating means, a part of the coolant air ventilated through said third ventilating means is discharged from said second ventilating means through the air gap between the rotor and the stator and a cc.lant air ventilated through said first ventilating means is discharged from said second ventilating means.

4,492,886

STARTING RELAY-TERMINAL BOX GROUP FOR HERMETIC MOTOR-DRIVEN COMPRESSORS

Alfredo Bar, Pavia, Italy, assignor to Necchi Società per Azioni, Pavia, Italy

Filed Jul. 20, 1982, Ser. No. 400,010
Claims priority, application Italy, Sep. 3, 1981, 42916 A/81
Int. Cl.³ H02K *11/00*
U.S. Cl. 310—68 C **1 Claim**



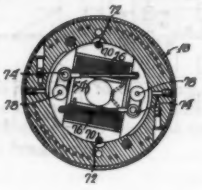
1. Starting relay-terminal box for hermetic motor-driven compressors for cooling apparatuses, comprising a base surface securable to the wall of the motor-driven compressor, a fixed cover covering a portion of said surface and forming with it a space of limited height inside, a starting relay positioned within said space consisting of a positive temperature coefficient resistance (PTCR), a removable cover covering the remaining portion of said base surface and forming with it a space larger than said space defined by said fixed cover and said base surface and a terminal box housed within the space defined by said removable cover and said base surface.

4,492,887

COMPACT RESISTOR ASSEMBLY FOR ROTARY ELECTRIC MACHINE

Jeffrey D. Baldwin, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 25, 1983, Ser. No. 526,341
Int. Cl.³ H02K *11/00*; H01C *3/18*
U.S. Cl. 310—68 R **12 Claims**



1. A rotary electric machine comprising:

a stator;

a rotor journalled for rotation within said stator about an axis and carrying an electrical conductor; and

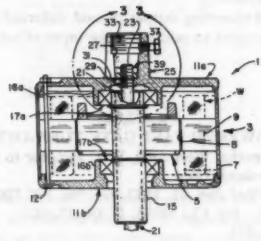
a resistor mounted on said rotor and electrically associated with the conductor, said resistor being narrow axially of said rotor and elongated radially but within the periphery of the rotor and extending across the axis thereof.

4,492,888

WIRE WAY SECUREMENT MEANS FOR DYNAMOELECTRIC MACHINE

C. Theodore Peachee, and Daniel R. Messner, both of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 11, 1983, Ser. No. 457,164
Int. Cl.³ H02K *11/00*
U.S. Cl. 310—71 **3 Claims**



1. In a dynamoelectric machine having a stator assembly including a core, a bore within said core, and a bearing support carried by said core, said dynamoelectric machine further comprising a rotor assembly having a rotor body rotatable within said bore, a shaft extending from said rotor body, said shaft being hollow and being journalled by bearings carried by said bearing support, a wire way extending through said hollow rotor shaft and being stationarily secured with respect to said stator assembly, wherein the improvement comprises: an opening within said bearing support for threadably receiving said wire way, an end of said wire way protruding beyond said bearing support, a locking nut threadably received on the end of said wire way protruding beyond said bearing support

thereby to lock said wire way with respect to said bearing support, said bearing support further having a hub thereon generally coaxial with said wire way opening, said hub having a blind opening therein facing away from said rotor, said blind opening being substantially coaxial with said opening receiving said wire way, said blind opening being of only slightly larger diameter than the diameter of said lock nut, the latter having means on its outer end for engagement by a tool for tightening said lock nut on said wire way and on the base of said blind opening within said hub surrounding said opening receiving said wire way.

4,492,889

STATOR OF SUBMERGED MOTOR

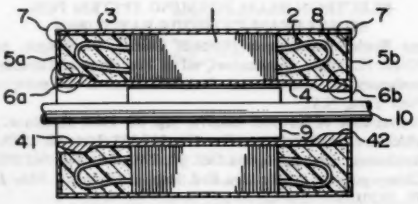
Keiji Fukushi; Yutaka Higashimura, both of Hitachi; Shinei Huzioka, Ibaraki; Syuzou Iwasa, Hitachi, and Kenzo Kadotani, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 17, 1983, Ser. No. 552,763

Claims priority, application Japan, Nov. 19, 1982, 57-202114

Int. Cl.³ H02K *5/10*

U.S. Cl. 310—87 **8 Claims**



1. A stator of a submerged motor comprising:

a stator core having a winding applied thereto;

an outer cylinder supporting said stator core at the outside;

an inner cylinder supporting said stator core at the inside; and

end covers joining said outer and inner cylinders together at end portions thereof to provide a watertight container composed of said outer and inner cylinders and said end covers and having a hardened resin filled in a vacant space between the inner and outer cylinders and the end covers;

wherein the improvement comprises:

increased wall thickness portions formed at said inner cylinder at axial opposite end portions thereof in the vicinity of joints of the inner cylinder with the end covers, one of said increased wall thickness portions being formed on an outer side surface of one axial end portion and the other increased wall thickness portion being formed on an inner side surface of the other axial end portion.

4,492,890

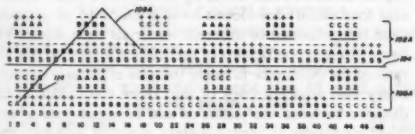
STATOR WINDING PROVIDING MAGNETOMOTIVE FORCE WAVE OF REDUCED HARMONIC CONTENT

Daniel J. MacDonald, Brookfield, Wis., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.

Filed May 18, 1983, Ser. No. 495,809

Int. Cl.³ H02K *3/00*

U.S. Cl. 310—184 **17 Claims**



1. A stator winding for a polyphase a.c. machine, said stator winding having a plurality of coils formed of turns of wire lying in a plurality of stator slots spaced along an air gap surface of a stator core, said coils being connected into groups of coils lying in adjacent stator slots for polyphase alternating current operation, each of said coil groups having at least one central coil with a predetermined number of turns and at least two outer coils, one of which lies on either side of said central coil, said outer coils containing reduced turns with respect to said central coil to provide a graded coil turn configuration to the coil group, the reduced turn coils of coil groups that are adjacent along the air gap surface of the stator core occupying common stator slots so that coils of adjacent coil groups overlap.

4,492,891

PIEZOELECTRIC ACTUATOR ARRANGEMENT WITH ADJUSTMENT FOR WEAR

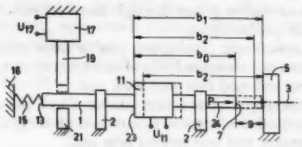
Heinz Wieters, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,031

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212062

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—328 **6 Claims**



1. An actuator arrangement for a controlled device, comprising

a ram having a front surface and an end remote from the front surface,

means for guiding the ram for movement along a line of movement such that the front surface is movable toward and away from the controlled device, and

an actuator for urging the front surface of the ram against the controlled device, characterized in that

the actuator is arranged to be displaceable along the line of movement together with the ram, and

the arrangement further comprises a re-adjusting abutment means for engaging said remote end of the ram and urging said remote end along said line of movement toward the controlled device, the re-adjusting abutment means consisting of a thrust block and a compression spring arranged between the thrust block and a compression spring arranged between the thrust block and the ram, and

a releasable locking actuator for locking the position of said remote end with respect to said controlled device.

4,492,892

PIEZOELECTRIC RESONATOR DEVICE SUPPORTED BY ANISOTROPIC RUBBER CONDUCTOR

Hiroshi Nakatani, Kanazawa, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Apr. 19, 1984, Ser. No. 601,848

Claims priority, application Japan, May 25, 1983, 58-79404[U]

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—345 **7 Claims**

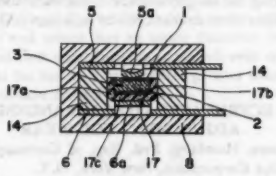
1. A piezoelectric resonator device comprising:

a first casing having a through-hole opening formed therein, said opening defining first and second side walls;

a first plate made of electrically conductive material applied at one end of said through-hole opening;

a second plate made of electrically conductive material applied at other end of said through-hole opening, thereby defining a cavity inside said first casing;

a rectangular plate shaped piezoelectric resonator element deposited with at least first and second electrodes at opposite surfaces, respectively, and having a configuration smaller than said cavity, said resonator element accommodated in said cavity such that said first electrode is facing said first plate and said second electrode is facing said second plate;



first anisotropic conduction pliable sheet pressure fitted between said first electrode and said first plate, thereby holding said piezoelectric resonator element between said first and second plates through said first anisotropic conduction pliable sheet;

second anisotropic conduction pliable sheet pressure fitted between one elongated side of said piezoelectric resonator element and said first side wall; and

third anisotropic conduction pliable sheet pressure fitted between other elongated side of said piezoelectric resonator element and said second side wall.

4,492,893

DUAL FILAMENT HALOGEN CYCLE AUTOMOTIVE-TYPE INCANDESCENT LAMP

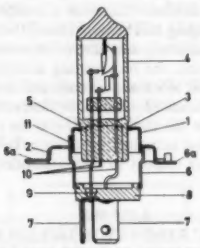
Hermann Steiner, Herbrechtingen, and Walter Schonherr, Giengen-Hürben, both of Fed. Rep. of Germany, assignors to Patent-Treuhand Gesellschaft fur elektrische Gluhlampen GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 30, 1982, Ser. No. 393,776

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1981, 8121528[U]

Int. Cl.³ H01J *5/48, 5/56, 5/58*

U.S. Cl. 313—318 **5 Claims**



1. Cementless halogen cycle incandescent lamp and base combination, especially dual filament lamp for motor vehicle headlight having

a lamp bulb (4) and a press stem (5) extending from the bulb;

a stem holder (1) retaining the lamp bulb therein and having a sleeve-like tubular portion surrounding the press stem,

a positioning ring (2) formed with a flange-like portion (6a), a depending sleeve-like portion (6) which telescopically surrounds the sleeve-like tubular portion of the stem holder (1) and further formed with at least three upstanding lugs (11) extending from the sleeve-like portion in alignment therewith and in a direction perpendicular with respect to the flange-like portion (6a) and in axial direction with respect to the lamp bulb along the outer wall of the tubular, sleeve-like portion;

and wherein

the sleeve-like tubular portion of the stem holder (1) projects outwardly from the depending sleeve-like portion (6) of the positioning ring (2) to define an outwardly extending region which is free from telescopic engagement with the depending sleeve-like portion of the positioning ring; and

the upstanding lugs of the positioning ring (2) are fitted against and welded to said outwardly extending region of the stem holder of the sleeve-like tubular portion of the stem holder,

whereby the relative alingment of the bulb (4) and the positioning ring (2) can be determined by positioning of the stem holder with respect to the upstanding lugs in accordance with the desired alignment before welding of the lugs to the stem holder.

4,492,894

ELECTRON-BEAM FORMING SYSTEM FOR MULTI-BEAM CATHODE-RAY TUBES

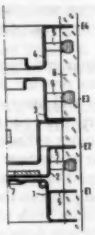
Hans Reule, Wendlingen; Hartmut Ganzle, Plochingen, and Horst H. Vogel, Denkendorf, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 429,572, Sep. 30, 1982, abandoned, which is a continuation of Ser. No. 149,102, May 12, 1980, abandoned. This application Oct. 17, 1983, Ser. No. 542,090

Claims priority, application Fed. Rep. of Germany, May 18, 1979, 2920151

Int. Cl.³ H01J *29/50, 29/82*

U.S. Cl. 313—414 **5 Claims**



1. An electron-beam forming system for multibeam cathode-ray tubes and particularly for color-picture tubes comprising:

a plurality of cathodes for generating a plurality of electron beams; and

at least four electrodes for acting on the electron beams, each of said four electrodes being supported from spaced glass beads to dispose each of said four electrodes in different planes lying one behind the other each differently spaced from said plurality of cathodes, each of said four electrodes including a plurality of apertures each aligned with a different one of said plurality of cathodes for passing the electron beam radiating therefrom, at least three of said four electrodes closest to said plurality of cathodes each being formed of different materials each selected to have different coefficients of thermal expansion so that the ratio of the difference in linear thermal expansion between every two adjacent ones of said three electrodes to the distance between the planes of said adjacent ones of said three electrodes is approximately constant whereby mechanical stresses and convergence errors are avoided during operation as said four electrodes are heated to

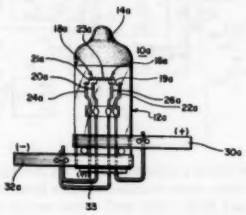
different temperatures depending on their proximity to the cathodes.

4,492,895

ARC RESISTANT HALOGEN HEADLAMP AND WIRING SCHEME THEREFOR

Robert A. Powell, Cookeville, Tenn., assignor to Edison International, Inc., Rolling Meadows, Ill.

Filed Sep. 23, 1982, Ser. No. 422,005
Int. Cl.³ B60Q 1/02
U.S. Cl. 315—82 **4 Claims**



1. An incandescent lamp for use in a headlamp of an automotive vehicle, said lamp being of the dual-filament type having a first, low beam filament and a second, high beam filament, said lamp being connected electrically to the positive and negative terminals of the vehicle battery through means for energizing said high beam filament momentarily in a "flash to pass" mode while said low beam filament is energized, said first, low and second, high beam filaments being mounted in a gas-filled, sealed envelope in generally parallel, closely adjacent, overlapping physical relationship, each said filament including first and second ends with the first and second ends of said low beam filament being at the same ends of said filaments as the first and second ends of said high beam filament, respectively, a central portion of said high beam filament being aligned generally with said first end of said low beam filament, said first end of said low beam filament and the second end of said high beam filament being connected to the negative terminal of said vehicle battery and the first end of said high beam filament and the second end of said low beam filament being connected to the positive terminal of said vehicle battery in a fashion essentially minimizing the potential difference between the overlapping portions of the filaments subsequent to the momentary energization of the high beam filament during said "flash to pass" mode, whereby upon operating said high beam filament in said "flash to pass" mode, arcing between said filaments is avoided.

4,492,896

ELECTRONIC CANDLE SYSTEM

Graham A. Jullien, Windsor, Canada, assignor to James J. Ogilvy, Windsor, Canada

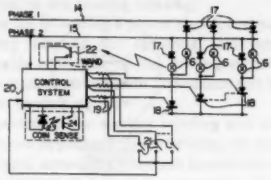
Filed May 4, 1983, Ser. No. 491,447
Claims priority, application Canada, Nov. 18, 1982, 415826
Int. Cl.³ H05B 37/02
U.S. Cl. 315—153 **20 Claims**

1. A decorative light array comprising:

(a) a plurality of light bulbs,

(b) a wand for manually pointing to a light bulb,

(c) means for sensing which light bulb has been pointed to by the wand, and



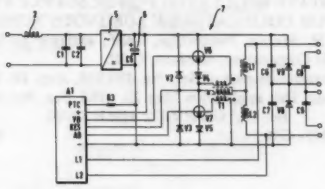
(d) means for lighting the light bulb upon said sensing having been completed.

4,492,897

MEANS FOR LIMITING AND CONTROLLING THE CURRENT OF A DISCHARGE LAMP

Martti Sairanen, Espoo, and Matti Virta, Helsinki, both of Finland, assignors to Hauenkalliontie 6 A 4, Espoo and Porientie 3 E 48, Helsinki, both of, Finland

Filed Sep. 20, 1982, Ser. No. 420,010
Claims priority, application Finland, Oct. 21, 1981, 813297; Jan. 12, 1982, 820096
Int. Cl.³ G02B 9/60
U.S. Cl. 315—219 **3 Claims**



1. Electronic ballast means for a discharge lamp, controllable by a supply voltage phase angle controller (1), with a lamp circuit (7) comprising a high frequency generator and before this circuit being connected a D.C. voltage filtering capacitor (6) which has through a rectifier (5) been connected to a filtering circuit consisting of a choke (2) and a capacitor (3), this latter circuit being connected through a phase angle controller (1) to an A.C. voltage source, characterized in that in series with capacitor (3) of said filtering circuit has been connected a current limiting or switching-off means (4) having its control electrode connected to a sensing means (9, 10) responsive to the changes in the generator's load.

4,492,898

MERCURY-FREE DISCHARGE LAMP

Walter P. Lapatovich, Watertown, and George R. Gibbs, Marlboro, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jul. 26, 1982, Ser. No. 402,175
Int. Cl.³ H05B 41/16, 41/24
U.S. Cl. 315—248 **7 Claims**

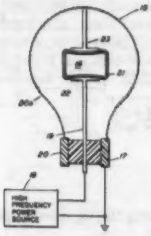
1. A mercury free molecular vapor discharge lamp comprised of:

a vessel having walls defining a discharge chamber;

said chamber free of mercury and filled with an inert gas and containing an amount of aluminum trichloride;

means for heating said aluminum trichloride for generating aluminum chloride vapor at a pressure not above 20 torr,

causing a mixture of said inert gas and said aluminum chloride vapor to fill said discharge chamber; and



means for initiating and sustaining a glow discharge through said mixture, which in response emits ultraviolet light in a band peaking near 261.4 nm.

4,492,899

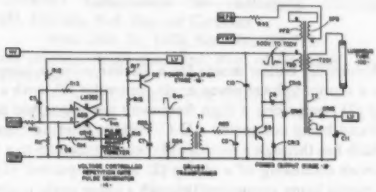
SOLID STATE REGULATED POWER SUPPLY SYSTEM FOR COLD CATHODE LUMINOUS TUBE

Marshal H. Martin, Northridge, Calif., assignor to Indicator Controls Corporation, Gardena, Calif.

Continuation-in-part of Ser. No. 293,018, Aug. 18, 1981, abandoned. This application May 23, 1983, Ser. No. 497,185

Int. Cl.³ G05F *1/00*; H05B *37/02*

U.S. Cl. 315—308 **9 Claims**



1. A regulated solid state power supply system for a cold cathode luminous tube, comprising: a transformer having a primary winding and having a first secondary winding connected to the cold cathode luminous tube; a power input circuit adapted to be connected to an energy source; a switching circuit connecting said power input circuit to the primary winding of said transformer; a voltage controlled repetition rate constant duration pulse generator circuit for producing constant duration pulses at a variable repetition rate; power amplifier driver circuitry connecting the output of the generator circuit to said switching circuit for introducing a constant duration variable repetition frequency pulse signal to said switching circuit alternately to cause energy to flow into the transformer and energy in the transformer to be transferred to the luminous tube in the form of variable frequency constant current pulses; and regulating control circuitry connected to said power input circuit and to said transformer and responsive to the line voltage of said energy source and the current flow in the luminous tube for supplying a regulating voltage to said pulse generator to control the repetition rate of the pulses produced by said generator.

4,492,900

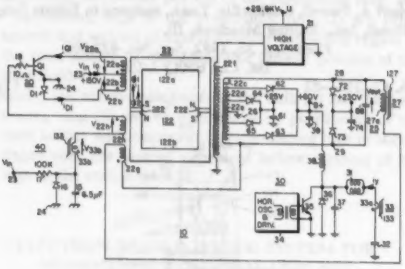
SINGLE CONTROLLABLE SWITCH, PUSH-PULL INVERTER FOR A TELEVISION RECEIVER FERRORESONANT POWER SUPPLY

David W. Lux, and Donald H. Willis, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,363

Int. Cl.³ H01J *29/70*

U.S. Cl. 315—411 **17 Claims**



1. A scan synchronized push-pull power supply for a television display system, comprising:

a deflection winding;

a deflection generator coupled to said deflection winding for generating scanning current in said deflection winding during trace and retrace intervals of each deflection cycle;

a source of direct voltage;

a power transformer having a primary winding wound around a portion of a magnetizable core and coupled to said direct voltage source and having a secondary winding;

a first controllable switch having a main current path and a control terminal for controlling conduction in said main current path;

a second switch having a main current path including first and second main current path terminals, the main current path of said first controllable switch being coupled to a first winding section of said primary winding to generate only a unidirectional current therein, the main current path of said second switch being coupled to a second winding section of said primary winding to generate only a unidirectional current therein, the main current paths of the two switches being coupled to the two winding sections of said primary winding in a push-pull arrangement;

means for developing a deflection rate signal that is synchronized with scanning current generation;

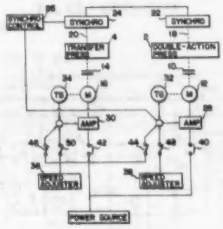
means for applying said deflection rate signal to the control terminal of said first switch to alternately switch conduction of said main current path of said first switch between conductive and nonconductive states during each deflection cycle in synchronism with scanning current generation, the switching of the main current path of said first switch to either the conductive or nonconductive state producing a change of voltage between the two main current path terminals of said second switch that switches the conduction state of the main current path of the second switch to the one that is opposite that of the main current path of the first switch, resulting in the development of an alternating polarity output voltage across said transformer secondary winding; and

a load circuit within said television display system energized by said output voltage.

4,492,901
CONTROL SYSTEM FOR SYNCHRONIZING COMBINATION PRESS LINE

Yoshihiro Higashi, Nonoichi, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 27, 1982, Ser. No. 382,642
Claims priority, application Japan, May 29, 1981, 56-80801
Int. Cl.³ H02P 5/46
U.S. Cl. 318—85 3 Claims



1. A control system for synchronizing a press line comprised of a transfer press and a double-action press, said transfer press including a first motor and a first drive shaft and said double-action press including a second motor and a second drive shaft, said control system comprising:

first detector means coupled to said first drive shaft for detecting an angular position of said transfer press in a press cycle and transmitting a first signal corresponding to the angular position thereof;

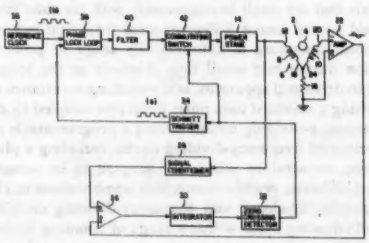
second detector means coupled to said second drive shaft for detecting an angular position of said double-action press in the same press cycle and transmitting a second signal corresponding to the angular position thereof; and

means for comparing said first and second signals and generating a third signal corresponding to a difference between said first and second signals, said third signal being fed only to said second motor for controlling the speed thereof.

4,492,902
PERMANENT MAGNETIC MOTOR COMMON LEG IMPEDANCE COMPENSATION MEANS

William Ficken, Berkeley Heights; Jerome Sears, Wyckoff, and Walter Parfomak, Wallington, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 500,739, Jun. 3, 1983,. This application Apr. 5, 1984, Ser. No. 597,036
Int. Cl.³ H02K 23/00
U.S. Cl. 318—254 5 Claims



1. A permanent magnet motor for a sensing device, characterized by:

a permanent magnet rotor;

a two-phase stator including a driving winding for providing a driving signal having a first phase and a sensing winding magnetically coupled to the driving winding for providing a sensing signal having a second phase;

an undesired common impedance connected to the driving winding and to the sensing winding;

power means for providing a power signal, and connected to the driving winding for applying said power signal thereto, with a portion of the driving signal appearing across the undesired common impedance and becoming a part of the sensing signal;

means connected to the sensing winding and to the undesired common impedance for combining the sensing signal and the signal across the common impedance;

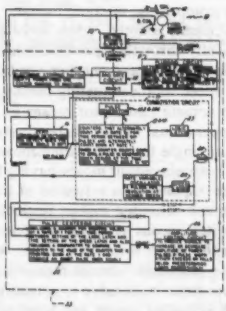
means connected to the power means and to the combining means for feeding back the combined signal to the power means to compensate for that portion of the driving signal appearing across the undesired common impedance and which becomes a part of the sensing signal; and

the power means being responsive to the combined signal fed back thereto for providing the power signal.

4,492,903
OPTIMUM EFFICIENCY BRUSHLESS DC MOTOR

John H. Knight, Kettering, and Milton S. Isaacson, Dayton, both of Ohio, assignors to Nu-Tech Industries, Inc., Dayton, Ohio

Division of Ser. No. 799,730, May 23, 1977, Pat. No. 4,238,717, which is a continuation-in-part of Ser. No. 561,537, Mar. 24, 1975, Pat. No. 4,027,215. This application Dec. 8, 1980, Ser. No. 213,929
The portion of the term of this patent subsequent to May 31, 1994, has been disclaimed.
Int. Cl.³ H02D 5/16
U.S. Cl. 318—341 9 Claims



1. A brushless dc motor coupled to a load and to a source of electrical power comprising, in combination:

a stator with a plurality of windings thereon, each said stator winding producing a flux when electrical current flows therethrough;

a rotor, rotatably mounted with respect to said stator, one of said stator and rotor being coupled to the load;

means for producing a magnetic field in said rotor which is fixedly oriented with respect to said rotor, said field interacting with said flux to produce a rotational torque force on said rotor when the physical positioning of said rotor with respect to conducting stator windings is such that the torque angle is greater than 0°, said magnetic field of said stator windings when said rotor is rotating;

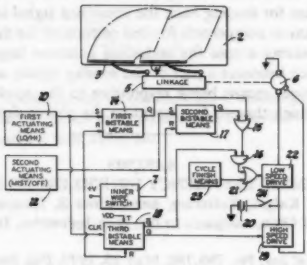
power signal generating means, coupled to the source of electrical power and responsive to said induced voltage in said stator windings, for applying power signals to said stator windings in a predetermined sequence, said power signals being applied at times always symmetric about the time when said torque angle is a predetermined value over a range of loads and over a range of power source variations.

4,492,904

WINDSHIELD WIPER SYSTEM WITH TOUCH CONTROL

Donald E. Graham, Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 528,629, Sep. 1, 1983, abandoned. This application Jul. 2, 1984, Ser. No. 625,567
Int. Cl.³ H02P 1/10
U.S. Cl. 318—444 6 Claims



1. Touch controlled drive apparatus for a wiper on a motor vehicle window comprising, in combination:

electric motor means adapted, when actuated, to drive said wiper cyclically through a predetermined path between an inner wipe position and another position;

high and low speed motor actuating means effective, when actuated, to actuate said motor means in high speed and low speed operational modes, respectively;

first and second single touch actuating means;

first bistable electronic circuit means having first and second output states responsive to actuation of the first and second single touch actuating means, respectively;

inner wipe switch means effective to generate an output signal when the wiper is not in its inner wipe position;

second bistable electronic circuit means having first and second output states responsive to actuation of the second single touch actuating means and inner wipe switch, respectively;

third bistable electronic circuit means having first and second output states, the second output state being effective to actuate the high speed motor actuating means and the first output state being effective when simultaneous with the first output state of either of the first and second bistable electronic circuit means to actuate the low speed motor actuating means, said third bistable electronic circuit means being responsive to actuation of the second single touch actuation means to reset to its first output state and thereafter responsive to successive actuations of the first single touch actuation means after the first such actuation to toggle between its first and second output states; and

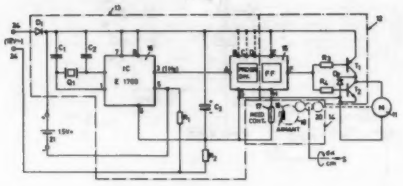
cycle finish means effective to actuate the low speed motor actuation means as required to finish any cycle of wiper operation and return said wiper at least to the inner wipe position, whereby continuous wiper operation may be initiated, stopped and switched between low and high speed modes and single cycle wiper operation may be initiated with only two single touch actuators.

4,492,905

INTERMITTENT DRIVE ARRANGEMENT

Jean-Francois Pfister, Rue du Soleil 10, CH-2605 Sonceboz, Switzerland

Continuation-in-part of Ser. No. 200,868, Oct. 27, 1980, abandoned. This application Mar. 4, 1983, Ser. No. 472,291
Claims priority, application France, Oct. 31, 1979, 79 27047
Int. Cl.³ G05B 5/00
U.S. Cl. 318—470 9 Claims

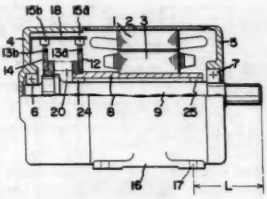


1. An arrangement for intermittently driving a monitoring apparatus operative without maintenance over an extended period of time to record data during widely spaced intervals of time, said arrangement comprising a DC motor having a shaft which drives said monitoring apparatus, the amount of torque required to drive said apparatus being variable, a DC power source, an electronic switching circuit disposed between said power source and said DC motor for selectively connecting said source to said motor and for selectively disconnecting said source from said motor, said switching circuit being free of electrical contacts that exhibit bounce during said connecting and disconnecting operations, switching-on control means coupled to said switching circuit for repetitively causing said electronic switching circuit to connect said power source to said DC motor thereby to energize said motor, and switching-off control means coupled to said switching circuit and responsive to movement of the shaft of said DC motor, after said motor has been energized, for disconnecting said power source from said motor as a function of a predetermined magnitude of movement of the shaft of the motor, said connecting and disconnecting operations being effected repetitively with said power source being connected to said DC motor for time intervals that are small in comparison with the time intervals that said power source is disconnected from said motor, said DC motor operating to automatically adapt its power consumption during said small time intervals to the torque required to drive said apparatus, said switching-on control means comprising a standard time pulse generator coupled to at least one frequency-dividing circuit having a programmable counting cycle, said frequency-dividing circuit including a plurality of setting connections which are adapted to be actuated in selected different, readily changeable combinations to change said counting cycle of said frequency-dividing circuit to a selected counting cycle within a range of counting cycles, the ratio of the maximum and minimum counting cycles within said range being at least 12 to 1, whereby said setting connections are adapted to permit ready selection and change of the intermittency rate of the repetitive connecting of said power source to said DC motor to a desired rate within a wide range of possible rates.

4,492,906
ELECTRIC MOTOR

Tadahiko Goto, Nakama; Kiyoshi Ouiki; Satoshi Murakami, both of Kitakyushu; Mitsunori Yokooji, Munakata; Norio Andou, and Norio Shimojyo, both of Kitakyushu, all of Japan, assignors to Yaskawa Electric Mfg. Co., Ltd., Fukuoka, Japan

Filed Oct. 8, 1981, Ser. No. 309,734
Claims priority, application Japan, Oct. 15, 1980, 55-145364; Oct. 29, 1980, 55-156071[U]; Apr. 30, 1981, 56-65372; Apr. 30, 1981, 56-65373; Aug. 14, 1981, 56-127897
Int. Cl.³ G01L 3/14
U.S. Cl. 318—488 25 Claims

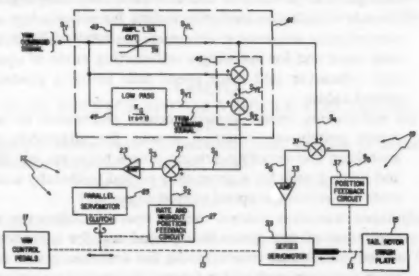


1. An electric motor comprising:
(a) a stator fixedly mounted on a motor casing,
(b) a rotor concentrically disposed in said stator,
(c) a hollow tubular drive shaft fixedly mounting said rotor thereon for rotating said rotor relative to said stator with a suitable circular gap between said stator and said rotor,
(d) an output shaft passing thru said hollow tubulur drive shaft said output shaft sharing the same rotating axis with said drive shaft,
(e) a resilient connecting member disposed at the non-load side of said motor and connecting said drive shaft and said output shaft for transmissing torque from said drive shaft to said output shaft and
(f) means for measuring the transmission torque by detecting the twisting amount of said resilient connecting member produced during transmission of said torque from said drive shaft to said output shaft.

4,492,907
COMBINED SERIES AND PARALLEL SERVO CONTROL FOR AIRCRAFT

Gordon R. Fabian, and Kenneth W. McElreath, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 28, 1982, Ser. No. 393,166
Int. Cl.³ G05D 1/08
U.S. Cl. 318—586 16 Claims

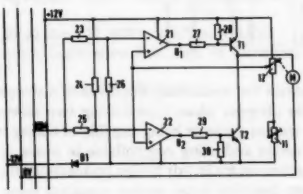


1. For use in an aircraft having (a) an autopilot for providing one or more flight control command signals and (b) a manually operable device mechanically coupled through appropriate linkages to a flight control surface so as to afford positioning of said surface, the apparatus comprising:
(1) servomotor first means connected to said linkages so as to operate in series with said manually operable device;
(2) second means connected to said first means output for providing a feedback first signal;
(3) third means for receiving said feedback first signal and a control first signal and producing therefrom a corrective error first signal which causes the servomotor first means output position to change so as to maintain said corrective error first signal substantially at zero;
(4) servomotor fourth means connected to said linkages so as to operate in parallel with said manually operable device;
(5) fifth means connected to fourth means output for providing a feedback second signal;
(6) sixth means for receiving said feedback second signal and a control second signal and producing therefrom a corrective error second signal which causes the servomotor fourth means output position to change so as to maintain said corrective error second signal substantially at zero; and
(7) seventh means for (a) receiving a predetermined autopilot generated command signal and (b) providing as output said control first signal and said control second signal such that said control first signal comprises a signal indicative of output signal of an amplitude limiter whose input signal is said autopilot generated command signal, and such that said control second signal comprises a signal indicative of excess of said autopilot generated command signal over a predetermined reference.

4,492,908
APPARATUS FOR SYNCHRONIZING THE SLATS OF MOTOR DRIVEN WINDOW BLINDS

Bernd Stöckle, and Klaus Pfendler, both of Bonndorf, Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 17, 1983, Ser. No. 467,521
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3206002
Int. Cl.³ C05B 1/06
U.S. Cl. 318—663 2 Claims



1. In a follow-up system for positioning the louvers of a venetian blind or the like, said system comprising: positive, negative, zero and nominal input leads; variable means for producing an input voltage on said nominal input lead to control the position of the louvers; first and second differential amplifiers each having a plus input, a minus input, and an output; first and second resistors connected from said nominal input lead to the minus inputs of said first and second amplifiers, respectively; a third resistor connected from the minus input of said first amplifier to said positive input lead; a fourth resistor connected from the minus input of said second amplifier to said negative input lead; first and second transistors; said first transistor having an emitter connected to said negative input lead; said first and second transistors each having a base and a collector; said second transistor having an emitter connected to said positive input lead; a collector connected to that of said first transistor; said transistors being of opposite conductivity types; a fifth resistor connected from said first amplifier output to said first transistor base; a sixth resistor con-

nected from said second amplifier output to said second transistor base; a seventh resistor connected from said first transistor base to said negative input lead; an eighth resistor connected from said second transistor base to said positive input lead; a motor having a drive shaft to tilt the louvers; said motor being connected from said transistor collectors to said zero input lead; and feedback means connected between said positive and negative input leads; said feedback means including a potentiometer having a winding and a wiper movable in contact with said winding in response to rotation of said drive shaft; said wiper being connected to said amplifier plus inputs.

4,492,909

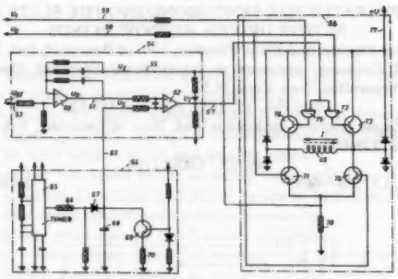
DEVICE FOR CONTROLLING THE DRIVE OF A STEPPING MOTOR, TO ADJUST THE LATERAL STITCH BIGHT AND/OR THE FEED LENGTH OF A SEWING MACHINE

Jürgen Hartwig, Ettlingen, Fed. Rep. of Germany, assignor to Pfaff AG Haushaltsmaschinen, Fed. Rep. of Germany

Division of Ser. No. 184,744, Sep. 8, 1980, Pat. No. 4,404,509. This application Mar. 22, 1982, Ser. No. 360,653

Int. Cl.³ H02K *29/02*

U.S. Cl. 318—696 3 Claims



1. A device for controlling the drive of a stepping motor of the bipolar chopper phase type having two section windings, with the section currents being capable of taking two opposite nominal values and being controllable in phase opposition by switching transistors in full bridge connection, the reversal of the current direction in the section windings being effected by varying the switching voltages applied to the base of the switching transistors and the steps to be executed being subdivided by intermediate graduation in staircase form, comprising a microcomputer for controlling the stepwise change of the magnitude of the section current of one of the section windings through one digital-to-analog converter, from its negative nominal value through zero to its positive nominal value and conversely, while holding the magnitude of the section current of the other section winding through another digital-to-analog converter at one of the constant maximum nominal values and, upon reaching the maximum nominal value of the section current of one of the section windings, controls the keeping up of this nominal value and controls the section current of the other section winding stepwise from the maximum positive nominal value through zero to the maximum negative nominal value thereof, and conversely, while holding the magntitude of the section current of one of the section windings at the previously reached constant maximum nominal value, and a counter connected to said digital-to-analog converters to supply thereto consecutive digital counter signals.

4,492,910

CONTROL CIRCUIT FOR A TIMING MOTOR

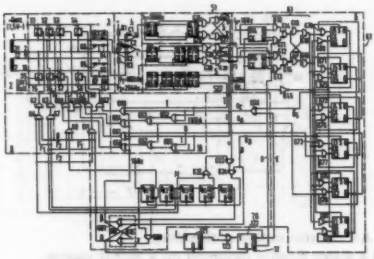
Dan-Cornelin Radacanu, Bad Soden, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Apr. 20, 1983, Ser. No. 486,760

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1982, 3215440

Int. Cl.³ H02P *5/16*

U.S. Cl. 318—772 3 Claims



1. An apparatus for controlling and regulating the rotational speed of a motor having a permanent-magnetic rotor with at least one pair of magnetic poles and a stator with at least first and second coils, said first coil being provided with driving pulses and said second coil being utilized as a control coil for providing a sinusoidal voltage corresponding to the motion of said rotor with respect to said stator in a nominal running mode, said apparatus comprising:

(a) comparator means for providing first and second sequences of substantially rectangular pulses by comparing said sinusoidal voltage with first and second reference voltages;

(b) oscillator and frequency divider means for generating a plurality of frequency signals, including a reference frequency signal;

(c) nominal running mode regulation means for correlating, at a first correlation frequency, said first sequence of pulses and said reference frequency signal with respect to phase and time duration and for generating and supplying to said second coil accelerating or braking driving pulses having a phase and time duration corresponding to the phase offset and time duration differential between said first pulse sequence and said reference frequency signal;

(d) mode switchover initiation means for monitoring said second pulse sequence to determine the rotational speed of said rotor and for initiating a self-starting mode of operation whenever said rotor speed falls below a predetermined value;

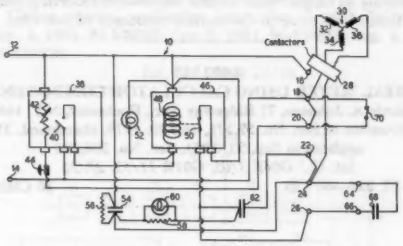
(e) self-starting mode control means, responsive to said mode switchover initiation means, for alternately reswitching and repoling driving pulses between said first and second coils for a given time period to thereby accelerate the rotational speed of said rotor; and

(f) mode transition control means, operable following the expiration of said given time period and for a predetermined transitional time interval, for correlating said first pulse sequence and said reference frequency pulses at a second frequency which is a multiple of said first correlation frequency and for generating and supplying said accelerating and braking pulses to said working coil at said second correlation frequency and for thereafter switching over into said nominal running mode of operation.

4,492,911
STATIC PHASE CONVERTER

Robert L. Molitor, 16 Oak Grove Dr., Hampshire, Ill. 60140

Filed Jul. 26, 1983, Ser. No. 517,506
Int. Cl.³ H02P 1/18
U.S. Cl. 318—779 23 Claims



8. A static phase converter for starting a motor having at least first, second and third windings, comprising:

first and second input terminals for receiving a single-phase alternating voltage;

first, second, third, fourth and fifth output terminals, said first output terminal adapted for connection to the first winding, said second and third output terminals connected together and adapted for connection to the second winding, and said fourth and fifth output terminals connected together and adapted for connection to the third winding;

said first and second input terminals respectively connected to said first output terminal and said second and third connected output terminals to energize said first and second windings upon the receipt of alternating current;

capacitance means, including running capacitance connected between said first input terminal and said fourth and fifth output terminals to provide an alternating voltage with a phase shift, with respect to the applied voltage, at the third winding, sufficient to maintain motor operation after starting, and starting capacitance connected between said fourth and fifth output terminals to provide starting a phase-shifted alternating voltage at the third winding, to develop starting torque for the motor for a predetermined interval; and

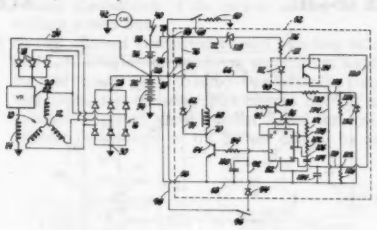
starting control means connected to said first and second input terminals, comprising relay means including a normally-closed contact connecting said first input terminal to said starting capacitance and shunting said running capacitance, and delay means connected to said relay means and time responsive to the application of the alternating voltage at said first and second input terminals to operate said relay means to open said normally-closed contacts, remove the shunt of said running capacitance, and disconnect said starting capacitance from said first input terminal.

4,492,912
DUAL VOLTAGE MOTOR VEHICLE ELECTRICAL SYSTEM

Robert J. Nowakowski, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 12, 1983, Ser. No. 457,495
Int. Cl.³ H02J 7/14, 7/24
U.S. Cl. 320—6 5 Claims

1. A dual voltage motor vehicle electrical system comprising in combination, first and second series connected batteries for supplying an electrical engine cranking motor with a voltage corresponding to the sum of the voltages of the batteries, at least one of said batteries being connected to supply at least one other electrical load with a lower voltage corresponding to its terminal voltage, a voltage regulated direct voltage generating means driven by the engine of the vehicle, conductor means connecting the output terminals of said generating means to the terminals of said first battery whereby said first battery is charged by said generating means, a control means having an input connected to said conductor means and an output connected to the terminals of said second battery for charging said second battery from the voltage applied to said conductor means, said control means including means for varying the

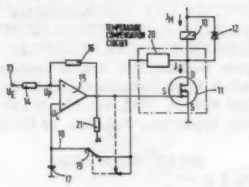


charging current supplied to said second battery as a function of the terminal voltage of said second battery, and means for maintaining said control means in operation for a predetermined time period following shut down of said engine to charge said second battery from said first battery for said time period.

4,492,913
CURRENT REGULATING CIRCUIT FOR AN ELECTRIC CONSUMER

Winfried Arnold, Vaihingen; Johannes Locher, and Bernd Schelling, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,713
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 3135805
Int. Cl.³ G05F 1/56
U.S. Cl. 323—282 16 Claims



1. In an electrical circuit in combination with a motor vehicle control unit having an electrical consumer and a switch means for supplying current to the consumer, the improvement which comprises:

current regulating means for regulating the consumer current;

a field effect transistor (FET) which is connected in the circuit to serve as said switching means and to also serve as a current measuring device for said current regulating means; and

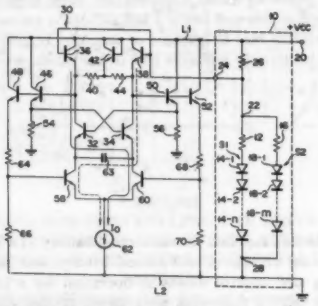
the field effect transistor having a current measuring pick-up means connected thereto.

4,492,914

TEMPERATURE-COMPENSATING BIAS CIRCUIT

Hisakazu Hitomi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 20, 1983, Ser. No. 515,579
Claims priority, application Japan, Jul. 29, 1982, 57-131242
Int. Cl.³ G05F 3/16
U.S. Cl. 323—313 6 Claims



1. A voltage generator comprising:

(a) a first line supplied with a first voltage corresponding to a source voltage;

(b) a second line supplied with a second voltage corresponding to the ground potential; and

(c) means connected between said first and second lines, for generating a third voltage corresponding to the product of said first voltage and a constant number greater than 0 and less than 1, said third voltage generating means comprising,

a first resistor having a first end connected to said first line and a second end,

a first circuit connected between the second end of said first resistor and said second line and including a second resistor and at least one diode,

a second circuit connected in parallel with said first circuit and including a third resistor and at least one diode, and

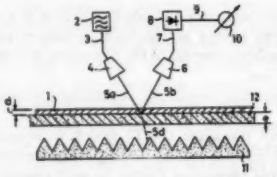
voltage output means connected to the second end of said first resistor, for providing a voltage generated at the second end of said first resistor corresponding to a junction between said first and second circuits as the third voltage.

4,492,915

METHOD AND APPARATUS FOR THE ELECTRONIC MEASUREMENT OF THE THICKNESS OF VERY THIN ELECTRICALLY CONDUCTIVE FILMS ON A NONCONDUCTIVE SUBSTRATE

Friedhelm Caspers, Bochum, Fed. Rep. of Germany, assignor to Elektro-Physik & Erich Steingroever, Fed. Rep. of Germany

Filed Feb. 25, 1982, Ser. No. 352,189
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1981, 3107675
Int. Cl.³ G01R 27/04
U.S. Cl. 324—58.5 R 24 Claims



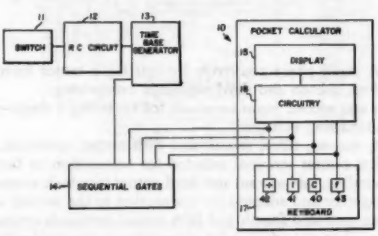
1. Method for the electronic measurement of the thickness of very thin electrically film supported on a nonconductive base, the thickness of said film being within the range of between 1 and 1000 nanometers and the conductivity of which is known, comprising the steps of: subjecting said film to a beam of microwave energy directed toward the film by a microwave transmitting means; receiving by microwave receiving means a portion of said microwave beam reflected by said film and measuring an output value of said microwave receiving means as a factor indicative of the surface resistance of said film.

4,492,916

DIGITAL METER USING CALCULATOR COMPONENTS

Benjamin A. Johnson, 77 Ridgeway Ave., Rochester, N.Y. 14615

Continuation of Ser. No. 59,371, Jul. 20, 1979, abandoned. This application Sep. 21, 1981, Ser. No. 304,241
Int. Cl.³ G06F 3/05; G01R 11/52, 27/26
U.S. Cl. 324—60 CD 16 Claims



1. A meter for measuring an analog value and displaying the result as a digital value, said meter comprising:

a. means of the type used in electronic pocket calculators for displaying digits;

b. electronic pocket calculator circuitry means electrically connected with said digital display means and having calculational capacity for operating said display means to display digits resulting from calculations;

c. electronic pocket calculator keyboard means having keyboard terminals electrically connected with said circuitry means and arranged so that actuation of keys on said keyboard means produces electric pulses at said keyboard terminals to operate said circuitry means and display digits on said display means;

d. at least one of said keyboard terminals being a summation terminal arranged relative to said circuitry means so that an electric pulse at said summation terminal advances a summation entered into said circuitry means and displayed by said display means;

e. RC circuit means including an integrating capacitor and a resistive element electrically interconnected so that changing a charge on said capacitor from an initial state to a terminal state requires a time interval that varies as a function of said analog value;

f. time base generator means electrically connected with said RC circuit and said summation terminal for producing and delivering actuation pulses to said summation terminal so that each pulse operates said circuitry means to advance said summation entered into said circuitry means and displayed by said display means;

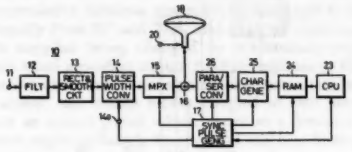
g. actuating switch means electrically connected with said RC circuit means and said time base generator means and arranged so that operation of said switch means starts said generator with said capacitor in said initial state; and

h. gating means electrically connected with said RC circuit means and said time base generator means and arranged for stopping said generator means when said capacitor reaches said terminal state so that the total of said actuation pulses delivered to said summation terminal and the value displayed by said display means are functions of said analog value.

4,492,917
DISPLAY DEVICE FOR DISPLAYING AUDIO SIGNAL LEVELS AND CHARACTERS

Mamoru Inami, Yokohama; Yoshiaki Tanaka, Fujisawa, and Zenju Ohtsuki, Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 30, 1982, Ser. No. 412,970
Claims priority, application Japan, Sep. 3, 1981, 56-138867; Sep. 3, 1981, 56-138868; Sep. 3, 1981, 56-138869; Sep. 3, 1981, 56-138870
Int. Cl.³ G01R 23/16
U.S. Cl. 324—77 A 8 Claims



1. A display device comprising:

a plurality of bandpass filters having filtering bands of respectively different center frequencies, for band-dividing and filtering an input audio signal supplied thereto through an input terminal;

synchronizing signal generating means for generating a horizontal synchronizing signal, a vertical synchronizing signal, and synchronizing pulses;

level indication signal producing means supplied with output signals of said bandpass filters, for converting the thus supplied output signal into a signal in synchronism with the horizontal synchronizing signal from the synchronizing signal generating means and having a pulse width in accordance with the level of the horizontal synchronizing signal, and serially obtaining the converted signal in synchronism with the vertical synchronizing signal from the synchronizing signal generating means by successive time-division carried out during a vertical scanning period;

character indication signal producing means stored with information signals for displaying characters and the like, for serially obtaining a character indication signal in synchronism with the synchronizing pulses from the synchronizing signal generating means;

composing means driven by said synchronizing signals from the synchronizing signal generating means, for obtaining a video signal by composing an output of said level indication signal producing means and an output of said character indication signal producing means; and

a picture tube,

said display device composing and displaying bars in a horizontal direction corresponding to the audio signal level, characters, and the like, on the picture tube, by the outputs of said composing means.

4,492,918
HIGH VOLTAGE POWER LINE PHASE ANGLE AND CURRENT MEASURING INSTRUMENT

E. Norman Hernandez, Seattle, and Eric M. Hammerquist, Arlington, both of Wash., assignors to Terra Technology Corp., Redmond, Wash.

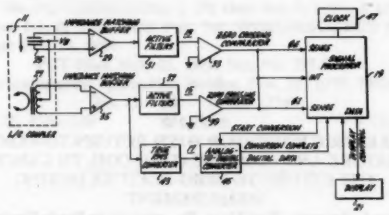
Filed Aug. 26, 1982, Ser. No. 411,378
Int. Cl.³ G06F 15/20
U.S. Cl. 324—83 R 33 Claims

1. A high voltage power line phase angle measuring instrument comprising:

an L/C coupler, including a coupling capacitor and a coupling inductor suitable for producing voltage and current signals whose fluctuations track the voltage and current fluctuations of the power carried by a high voltage power line when said L/C coupler is positioned suitably close to, but spaced from, a single power line;

a voltage channel connected to said coupling capacitor of said L/C coupler for: receiving said voltage signal, filtering said voltage signal to remove undesirable components therefrom, and squaring said filtered voltage signal to produce a square wave voltage signal that tracks said voltage fluctuations of the power carried by said high voltage power line;

a current channel connected to said coupling inductor of said L/C coupler for: receiving said current signal, filtering said current signal to remove undersirable components therefrom, and squaring said filtered current signal to produce a square wave current signal that tracks said current fluctuations of the power carried by said high



voltage power line, the circuits included in said voltage and current channels being formed such that the phase shift produced in said channels as the voltage and current signals are filtered and squared is substantially identical whereby the phase angle between said square wave voltage and current signals is the same as the phase angle between the voltage and current fluctuations of the power carried by said voltage power line;

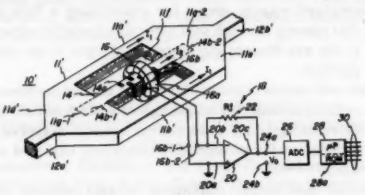
a signal processor connected to said voltage and current channels for receiving said square wave voltage and current signals and determining the phase angle between said voltage and current signals based on the time between transitions of said square wave voltage and current signals; and,

a display connected to said signal processor for displaying the phase angle determined by said signal processor.

4,492,919
CURRENT SENSORS

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 12, 1982, Ser. No. 367,315
Int. Cl.³ G01R 1/20; H01F 40/06
U.S. Cl. 324—127 15 Claims



1. Apparatus for sensing the magnitude of a current flowing therethrough, comprising:

a member having a plurality of current-carrying first element portions each having substantially the same resistance R_1, and a second current-carrying element portion, coplanar with at least one of said first element portions, having a meander-line geometry and a second resistance R_2; each of said first element portion resistance R_1 being

less than the resistance R_2 of said second element portion; said second element portion being electrically connected in parallel with at least one of said first element portions; said plurality of first element portions being arranged to each provide an induced current in the second element portion of magnitude and phase selected to substantially cancel one another; and

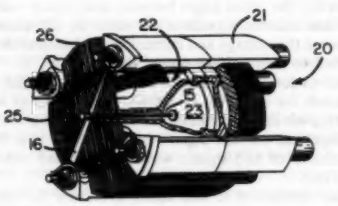
means associated with the second element portion for transforming the magnitude of current flowing through said second element portion to a sensor output current related to the total current flowing through said member by the ratio of the second resistance R_2 and the first resistance R_1.

4,492,920

ELECTRIC INDICATOR WITH RETURN-TO-ZERO FEATURE AND COMPENSATING COIL TO CANCEL THE RETURN-TO-ZERO FEATURE DURING MEASUREMENT

Arthur L. Reenstra, New Hope, Pa., assignor to Beede Electrical Instrument Co., Inc., Penacook, N.H.

Filed Jun. 22, 1981, Ser. No. 275,977
Int. Cl.³ G01R *1/20*
U.S. Cl. 324—146 **14 Claims**



1. An electrical indicator having an indicator pointer and means for angularly displacing said pointer in response to variations in the magnitude of an external electrical signal, said indicator comprising:

a rotor retaining said indicator pointer and being magnetized to provide opposite magnetic poles;

means for rotatably mounting said rotor and said indicator pointer;

permanent magnet means for establishing a first magnetic flux passing through said rotor substantially perpendicular to the axis thereof and urging said rotor to an equilibrium position;

first coil means oriented in relation to said permanent magnet means such that on passage of a predetermined current therethrough, an independent second magnetic flux is established for substantially cancelling said first magnetic flux;

second coil means responsive to said external electrical signal and oriented to establish a third flux disposed at an angle representative of said external signal magnitude;

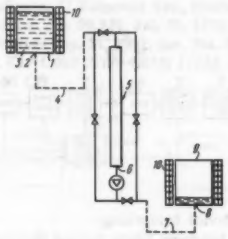
wherein said rotor and indicator pointer rotate from said equilibrium position to a position at said angle of said flux of said second coil means when both first and second coil means are energized as aforesaid and said rotor and said pointer return to said equilibrium position pursuant established by the flux of said permanent magnet means when said first and second coil means are not energized.

4,492,921

METHOD OF DETERMINING THE QUANTITY OF SOLID FRACTION OF FERROMAGNETIC MATTER IN A FLUID

Alexandr V. Sandulyak; Vyacheslav I. Garaschenko, and Oleg J. Korkhov, Rovno, all of U.S.S.R., assignors to Ukrainsky Institut Inzhenerov Vodnogo Khozyaistva, Leninskaya, U.S.S.R.

Filed Apr. 6, 1983, Ser. No. 482,453
Int. Cl.³ G01N *15/06*
U.S. Cl. 324—204 **3 Claims**



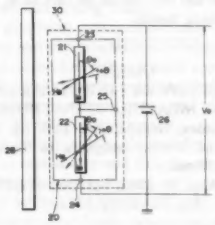
1. A method of measuring the quantity of the solid fraction of ferromagnetic matter in a fluid, including recirculating a predetermined volume of the fluid to be analyzed through magnetized filtering packing, acting periodically upon said fluid subjected to recirculation through the magnetized packing by an attenuating magnetic field outside the magnetized packing, to demagnetize the particles of the solid fraction remaining in the fluid, measuring the content in said fluid of the solid fraction of the material between its exit from the packing and successive re-entry into the packing, and continuing said recirculation until a permanent residual content of the solid fraction in said fluid is attained, used to evaluate the initial content thereof.

4,492,922

MAGNETIC SENSOR WITH TWO SERIES-CONNECTED MAGNETORESISTIVE ELEMENTS AND A BIAS MAGNET FOR SENSING THE PROXIMITY OF A RELATIVELY MOVABLE MAGNETICALLY PERMEABLE MEMBER

Hiroyuki Ohkubo, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 8, 1981, Ser. No. 328,613
Claims priority, application Japan, Dec. 9, 1980, 55-172553; Dec. 9, 1980, 55-172554
Int. Cl.³ G01B *7/14*; G01R *33/02*
U.S. Cl. 324—207 **12 Claims**



1. A magnetic sensor for sensing the proximity of a magnetically permeable member, the sensor and member being relatively movable with respect to each other and having an axis of movement disposed within a fixed plane, said magnetic sensor comprising first and second coplanar magnetoresistive ele-

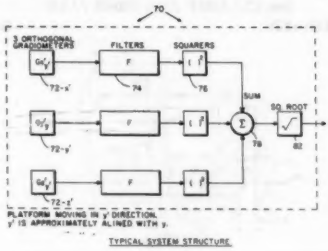
ments, each magnetoresistive element having a main current conducting path and processing anisotropic resistance as a function of the direction of a resultant magnetic field applied thereto, said two magnetoresistive elements being connected in series with each other to define a junction therebetween; means for supplying a d. c. current to said series-connected magnetoresistive elements; bias means for supplying first and second saturating bias magnetic fields to said first and second magnetoresistive elements, respectively, at the same angle θ_o only to each of the respective main current conducting paths thereof in the absence of said magnetically permeable member, with said first and second saturating bias magnetic fields being the only bias magnetic fields supplied to said first and second magnetoresistive elements, respectively, said angle θ_o differing substantially from 90° and 270°, said angle at which each bias field is supplied being changed by substantially equal and opposite small deviation angles $\pm\Delta\theta$ in response to the relative movement of said permeable member proximate said magnetic sensor; and output means coupled to said junction to produce an output signal which varies as a function of said deviation angles by which the angles of said bias fields change.

4,492,923

APPARATUS FOR MEASURING THE SPATIAL SCALAR VARIATION OF A MAGNETIC FIELD WITH VECTOR MAGNETIC SENSORS ON A MODERATELY STABLE MOVING PLATFORM

George W. Byram, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 21, 1982, Ser. No. 390,461
Int. Cl.³ G01B 7/14; G01R 33/02
U.S. Cl. 324—207 7 Claims



TYPICAL SYSTEM STRUCTURE

1. An apparatus for measuring the spatial variation of magnetic field, along a path of motion of the apparatus, the magnetic field having the coordinates x, y and z with respect to a fixed frame of reference, the apparatus, when in use, generally being mounted on a movable platform, the platform defining another set of orthogonal axes, x', y' and z', the two sets of axes being substantially parallel, the apparatus comprising:

three means for measuring the gradient of a magnetic field, the means being oriented along the mutually orthogonal axes, x', y' and z' on the platform, the direction of motion being such that the angles between corresponding axes, for example between axes y and y', are within predetermined limits, the outputs of the gradiometers comprising the gradients $Gx'_{y'}$, $Gy'_{y'}$ and $Gz'_{y'}$ of the magnetic field when the motion is considered to be in the y' direction;

three means for filtering, each means having an input connected to the output of one of the means for measuring, the means having a configuration such that its output signal for a doublet input is a relatively narrow positive peak with a relatively wide negative area on each side of the peak, the net area approximating zero;

three means for squaring, each having an input connected to the output of a means for filtering, for squaring their input signals;

a means for summing, having three inputs connected to the outputs of the means for squaring, for obtaining the sum of the squares of the components x', y' and z' of the magnetic field when the platform is moving in the y direction; and

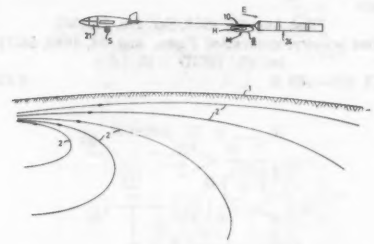
means, whose input is connected to the output of the means for summing, which takes the square root of its input signal, and has as an output the variation of the magnitude of the magnetic field along the y' direction, which is substantially the direction in which the platform is moving.

4,492,924

METHOD AND APPARATUS FOR ORE PROSPECTING UTILIZING AN AERIAL TRANSMITTER AND AERIAL RECEIVER

Bruno Y. Nilsson, Boliden, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

PCT No. PCT/SE80/00306, § 371 Date Jul. 8, 1981, § 102(e) Date Jul. 8, 1981, PCT Pub. No. WO81/01617, PCT Pub. Date Jun. 11, 1981
PCT Filed Nov. 28, 1980, Ser. No. 285,077
Claims priority, application Sweden, Nov. 29, 1979, 7909875
Int. Cl.³ G01V 3/165, 3/16
U.S. Cl. 324—330 8 Claims



1. A method for determining the electrical conductivity of the ground, particularly in connection with aerial prospecting, comprising generating an electromagnetic field which induces an electric current in the ground by means of an aerial transmitter unit, measuring the magnetic and electric fields induced by said current at the measuring site by means of an aerial receiver unit, said fields representing a measurement of said electrical conductivity and variations therein, said electromagnetic field from the transmitter being transmitted horizontally and directed transversally of an imaginary line that connects the transmitter with the receiver; a horizontal component of an electric field E being measured in the receiver in a radial direction to the transmitter; a magnetic field H being measured in a direction parallel with the magnetic field from the transmitter; and forming from the measured magnitudes the ratio E/H and/or the phase difference ψ, both of which are dependent on the electrical conductivity of the ground.

4,492,925

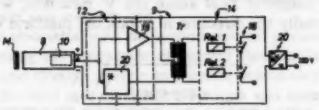
TESTING AND EVALUATING CIRCUIT FOR PROXIMITY SWITCHES IN MACHINE CONTROL MEANS

Heinz Kammerer, Ostfildern, and Hans Langheinrich, Leonberg-Silberberg, both of Fed. Rep. of Germany, assignors to Gebhard Balluff Fabrik feinmechanischer Erzeugnisse GmbH & Co., Neuhausen, Fed. Rep. of Germany

Filed Feb. 26, 1982, Ser. No. 352,804
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110390
Int. Cl.³ G01R 31/02, 31/32
U.S. Cl. 324—418 13 Claims

1. A testing and monitoring circuit for a proximity switch forming an element of a machine control means including in combination, a proximity switch alternately switchable be-

tween two operating conditions, control circuit means for switching said proximity switch between its two operating conditions to generate a timed output signal with a given frequency and monitoring circuit means responsive to said



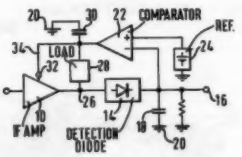
proximity switch and to said control circuit means for producing a clear signal for the duration of said timed output signal and a blocking signal for the machine control means in the absence of changes in the potential of the output signal from the proximity switch.

4,492,926

AMPLITUDE MODULATION DETECTOR

Hiromi Kusakabe, and Atsushi Ogawa, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 12, 1981, Ser. No. 292,263
Claims priority, application Japan, Aug. 14, 1980, 55-112074
Int. Cl.³ H03D *1/10, 1/06*
U.S. Cl. 329—205 R **4 Claims**



1. An amplitude modulation detector having a constant D.C. output voltage, for detecting the audio component of an AM signal, comprising:

AM detection means responsive to first and second input signals for maintaining said constant D.C. output voltage regardless of level changes in said AM signal, said first signal being the AM signal;

a D.C. reference voltage; and

feedback means connected to the output of said detection means for comparing said D.C. output voltage of said detection means with said D.C. reference voltage to produce said second sigal, said feedback means including a D.C. voltage comparator supplied with said D.C. reference voltage and said constant D.C. output voltage being regulated to a value signal to said D.C. reference voltage by said feedback means.

4,492,927

OFFSET VOLTAGE COMPENSATION CIRCUIT

Douglas R. Holberg, Austin, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Division of Ser. No. 265,983, Jun. 30, 1980, Pat. No. 4,390,754. This application Sep. 30, 1982, Ser. No. 430,446
Int. Cl.³ H03F *1/01*
U.S. Cl. 330—9 **4 Claims**

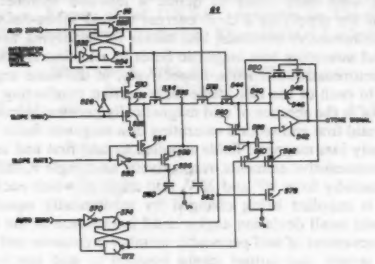
1. A circuit to compensate for the offset voltage of an operational amplifier, comprising:

means for connecting the output terminal of said amplifier to a first of the input terminals;

a capacitor having a first terminal thereof connected to the second input terminal of said amplifier;

means for connecting the second terminal of said capacitor to said first input terminal when said output terminal and said first terminal are connected; and

means for connecting said second terminal of said capacitor



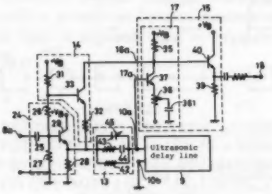
to a reference node when said output terminal is not connected to said first terminal, said capacitor charged to provide at said second input terminal an offset compensating voltage for said amplifier.

4,492,928

COMB FILTER

Daishiro Hayakawa, Ashiya; Masao Akimoto, Neyagawa; Katsumi Narita, Neyagawa, and Kenroku Tani, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 12, 1981, Ser. No. 272,919
Claims priority, application Japan, Jun. 23, 1980, 55-85548
Int. Cl.³ H03F *3/68;* H04B *11/00*
U.S. Cl. 330—126 **10 Claims**



1. A comb filter comprising

an ultrasonic delay line element having a common terminal for inputting an ultrasonic signal therethrough in said delay line and at the same time taking a delayed ultrasonic signal therethrough out of said delay line,

an impedance element connected between a signal input terminal and said common terminal,

a first amplifier circuit connected to an end of the impedance element,

a second amplifier circuit connected to the other end of the impedance element,

an operation circuit which provides summing of or subtraction between output signals of said first amplifier and said second amplifier to produce an output signal.

4,492,929

OPERATIONAL AMPLIFIER HAVING ENHANCED GAIN THROUGH CURRENT FEEDBACK

Robert L. Vyne, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

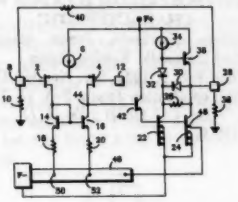
Filed May 13, 1983, Ser. No. 494,193
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—253 **7 Claims**

1. An integrated operational amplifier circuit of the type which includes an output, and power supply conductor means

for distributing power from a first source of supply voltage, said integrated operational amplifier circuit comprising:

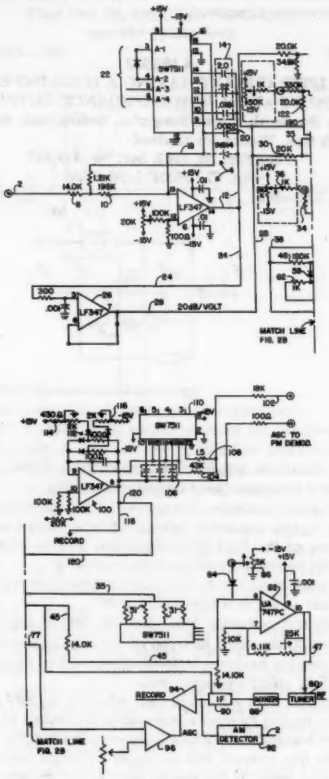
an input stage having an output node and including first and second input transistor devices, said input stage being coupled across a portion of said power supply conductor means; and

an output stage coupled to said output node and including first and second NPN transistor means each having base,



emitter and collector terminals, said first NPN transistor means for conducting load current to said output and said second NPN transistor means for receiving load current from said output, said output stage being coupled to said power supply conductor means for supplying a portion of the current received by said second transistor means to said power supply conductor to generate a voltage in said input stage to compensate for voltage translated back to said output node from said output stage.

signal applied to said gain controlled amplifying means over the entire operating range of said amplifying means,



means applying said further gain control voltage to said second amplifying means.

4,492,930

AUTOMATIC GAIN CONTROL SYSTEM

Robert C. Knowles, Ocala, and Darrell R. Marshall, Palatka, both of Fla., assignors to Microdyne Corporation, Ocala, Fla.

Filed Oct. 13, 1981, Ser. No. 310,959
Int. Cl.³ H03G *3/30*
U.S. Cl. 330—284 **5 Claims**

1. An automatic gain control system comprising:

a first controlled amplifying means for producing an output signal that is a function of a varying amplitude carrier input signal,

a second controlled amplifying means for producing an output signal that is a function of a varying amplitude carrier input signal,

an automatic gain control circuit for producing a first gain control voltage which varies as a function of the amplitude level of the input carrier signal,

said amplifying means including means for varying the gain of said amplifying means as a function of the first gain control voltage only above a prescribed voltage level greater than 0,

means for applying said first gain control voltage to said first amplifying means,

said automatic gain control circuit further comprising means for generating a further gain control voltage for establishing a linear logarithmic relationship between the gain control voltage and the varying amplitude input carrier

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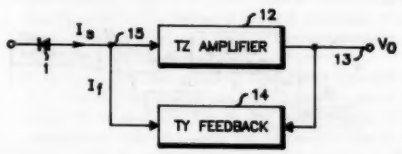
4,492,931

INFRA-RED RECEIVER FRONT END

Lionel Deweck, Mont de Vaux, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 396,553, Jul. 9, 1982,. This application Jul. 9, 1984, Ser. No. 629,739
Int. Cl.³ H03F *1/34*
U.S. Cl. 330—294 **11 Claims**



1. A front-end circuit suitable for use in an infra-red receiver, the circuit comprising a transimpedance amplifier for providing an output voltage at an output terminal, a current source connected to supply an input current to an input terminal of the transimpedance amplifier; and transadmittance feedback means

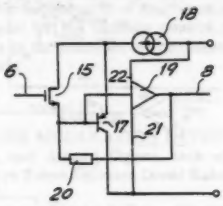
having a low pass transfer characteristic and connected between the output terminal and the input terminal of the transimpedance amplifier so that unwanted signals in the output voltage due to undesirable low frequency components in the input current are removed.

4,492,932

AMPLIFIER CIRCUIT HAVING A HIGH-IMPEDANCE INPUT AND A LOW-IMPEDANCE OUTPUT

Andreas Rusznyak, Chene-Bougeries, Switzerland, assignor to Asulab S.A., Bienne, Switzerland

Filed Sep. 20, 1982, Ser. No. 419,887
Int. Cl.³ H03F *1/38, 3/16*
U.S. Cl. 330—300 **11 Claims**



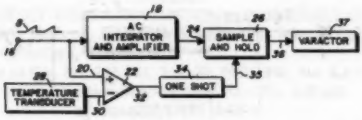
1. An electronic amplifier circuit having a high-impedance input and a low-impedance output, comprising:
- a field effect transistor, the gate of which forms said input;
- a first bipolar transistor having its base connected to the source of the field effect transistor and its emitter connected to the drain of the same transistor;
- a first current source having one terminal connected to the emitter of the first bipolar transistor;
- a supply source having two poles, the first of which is connected to the other terminal of the current source;
- a first resistor having a terminal connected to the source of the field effect transistor; and
- an amplifier with a positive gain which is slightly less than unity, having its input connected to the source of the field effect transistor, its output connected to the other terminal of the first resistor, and its supply terminals connected to the two poles of the supply source, the collector of the first bipolar transistor in turn being connected to the second pole of the supply source, the output of said circuit being formed either by the emitter of the first bipolar transistor or by the output of said amplifier.

4,492,933

TEMPERATURE COMPENSATION CIRCUIT FOR OSCILLATOR WITH PARABOLIC CHARACTERISTIC

Steven E. Grieco, Mt. Prospect, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 28, 1982, Ser. No. 402,511
Int. Cl.³ H03L *1/02*
U.S. Cl. 331—66 **10 Claims**



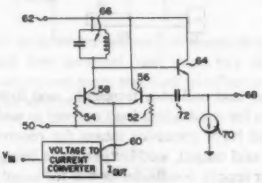
10. A method for temperature compensating an oscillator circuit having a frequency response that is parabolic with respect to temperature, comprising:
- generating a ramp signal having a linear voltage change with respect to time;
- integrating said ramp signal to produce single-sided parabolic voltage functions with respect to a time base;
- sampling said parabolic voltage functions at selected times corresponding to varying ambient temperatures to produce compensating voltages; and
- varying the frequency of said oscillator circuit in response to said compensating voltages.

4,492,934

VOLTAGE CONTROLLED OSCILLATOR WITH LINEAR CHARACTERISTIC

Yasuhiro Sugimoto, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 5, 1982, Ser. No. 346,234
Claims priority, application Japan, Feb. 12, 1981, 56-19479
Int. Cl.³ H03B *5/04, 5/12*
U.S. Cl. 331—117 R **5 Claims**



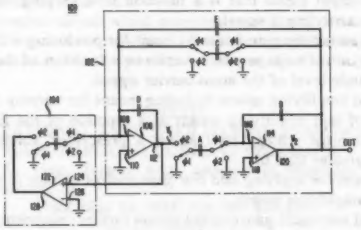
1. An oscillator comprising:
- first and second bias terminals;
- a first transistor whose base and collector are connected to said first and second bias terminals, respectively;
- a second transistor whose base and emitter are connected to said first bias terminal and the emitter of said first transistor, respectively;
- voltage-to-current converter means for generating a current proportional to the square of an input voltage, wherein said voltage-to-current converter generating means is connected to the emitters of said first and second transistors;
- a resonance circuit connected between the collector of said second transistor and said second bias terminal; and
- a feedback path, having an amplifier and a capacitor, connected between the collector of said second transistor and the base of said first transistor.

4,492,935

SWITCHED CAPACITOR OSCILLATOR FORMED BY A DAMPED RESONATOR WITH SATURABLE FEEDBACK

Paul E. Fleischer, Little Silver, N.J.; Apparajan Ganesan, Indianapolis, Ind., and Kenneth R. Laker, Staten Island, N.Y., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 11, 1983, Ser. No. 474,685
Int. Cl.³ H03B *5/06*; H03C *1/00, 3/00*
U.S. Cl. 331—135 **15 Claims**



1. An oscillator, comprising

a switched capacitor damped resonator network having at least one signal input node and at least one signal output node and including at least one amplifier, and

a switched capacitor nonlinear feedback control network coupling one of said output nodes to one of said input nodes, said feedback control network comprising a saturable device for affecting the waveform of the feedback signal to said resonator network.

4,492,936

FRACTIONAL-DIVISION FREQUENCY SYNTHESIZER FOR DIGITAL ANGLE-MODULATION

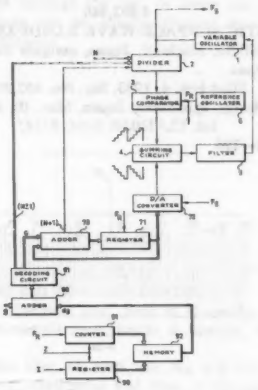
Alain Albarello; André Roullet, and Alberto Pimentel, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 17, 1982, Ser. No. 408,874

Claims priority, application France, Aug. 17, 1981, 81 15808

Int. Cl.³ H03C *3/06*; H04B *1/04*

U.S. Cl. 332—19 **4 Claims**



1. A fractional-divisional frequency synthesizer for delivering an output signal of the form $F_S=(N+k)\,F_R$, where N is the integral part and k is the fractional part of the number N+k and F_R is the frequency of a reference signal, wherein said synthesizer comprises:

a reference oscillator for delivering the reference signal;

a variable oscillator having a control input and an output, said output providing said output signal F_S;

a variable-oscillator control loop comprising in series a variable divider having one signal input coupled to the output of the variable oscillator and one control input to select the divisor N+1, said divider having a preselected divisor N, a comparator for comparing the phase of the output signal of the divider with the phase of the reference signal, a summing device having a first input coupled to the output of the comparator and a second input, and a filter coupled between the output of the summing device and the control input of the variable oscillator, means having a main output for delivering a number $G=k\,(M)$, M being a positive whole number; and

a phase accumulator for receiving the reference signal and the signal G in order to perform modulo-M summation of the number G at the frequency F_R, said phase accumulator having sum and carry outputs respectively coupled to the second input of the summing device and to the control input to select the divisor N+1 of the variable divider and wherein, in order to angle modulate the synthesizer output signal F_S by digital information, the means comprises an adder, said adder having an output coupled to the main output and a first adder input for receiving a constant number g and a second input for receiving a number dg which is representative of the digital information.

4,492,937

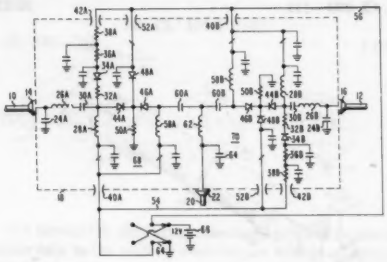
TERMINATED SWITCH

Gerald E. Theriault, Hopewell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 29, 1982, Ser. No. 437,829

Int. Cl.³ H03H *7/48*

U.S. Cl. 333—103 **4 Claims**



1. Switch apparatus, comprising:

first and second input ports and an output port;

first and second signal switch sections for selectively coupling a signal between one of said first and second input ports, respectively, and said output port,

said first signal switch section including a first pair of diodes each having first and second electrodes, said first and second diodes being oppositely-poled and connected in series with a first junction formed by said first electrodes, and a first shunt diode having first and second electrodes, said first electrode being coupled to said first junction;

said second signal switch section including a second pair of diodes eaching having first and second electrodes, said first and second diodes being oppositely-poled and connected in series with a second junction formed by said first electrodes, and a second shunt diode having first and second electrodes, said first electrode being coupled to said second junction,

said first electrodes of each diode coupled to respective ones of said first and second junctions being of the same type; and

biasing means for selectively biasing said first and second series coupled diodes into a conductive state to selectively couple a signal between said first and second inputs, respectively, and said output port,

said biasing means establishing a selectable bias potential between first and second conductors, said second electrodes of said first pair of series diodes being coupled to receive bias potential from said first conductor, said second electrode of said first shunt diode being coupled to receive bias potential from said second conductor, said second electrodes of said second pair of series diodes being coupled to receive bias potential from said second conductor, and said second electrode of said second shunt diode being coupled to receive bias potential from said first conductor,

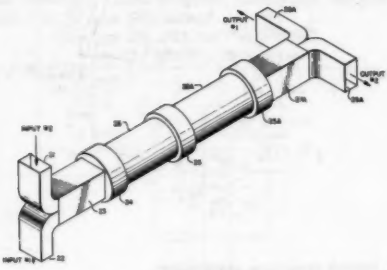
for each selective bias potential established between said first and second conductors, the diodes of one of said pairs of series-connected diodes being biased into a conductive state to couple the respective one of said input ports to said output port and the shunt diode coupled to the junction of the other of said series-connected diodes being biased concurrently into a conductive state to automatically bias the diodes of said other pair of series diodes into a non-conductive state to decouple the other of said input ports from said output port.

4,492,938

SYMMETRICALLY-CONFIGURED VARIABLE RATIO POWER COMBINER USING SEPTUM POLARIZER AND QUARTERWAVE PLATE

Lock R. Young, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Sep. 21, 1982, Ser. No. 420,887
Int. Cl.³ H01P 5/04, 5/18
U.S. Cl. 333—111 **26 Claims**



5. A microwave power divider for providing controllable amounts of microwave energy at first and second output ports comprising:

an input waveguide adapted to receive linearly polarized microwave energy;

first waveguide means serially coupled to said input waveguide for converting said linearly polarized microwave energy into circularly polarized microwave energy; and

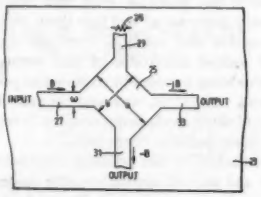
symmetrically configured output waveguide transducer means having an input port and a pair of output ports symmetrically disposed with respect to the input port thereof, which input port is coupled to receive circularly polarized microwave energy converted by said first waveguide means, so that at said pair of output ports there are provided respective amounts of microwave energy in accordance with the circular polarization conversion action of said first waveguide means.

4,492,939

PLANAR, QUADRATURE MICROWAVE COUPLER

John W. Burns, Middlesex, England, assignor to The Marconi Company Limited, England

Filed Dec. 1, 1982, Ser. No. 445,955
Claims priority, application United Kingdom, Dec. 2, 1981, 8136362
Int. Cl.³ H01P 5/18
U.S. Cl. 333—116 **1 Claim**



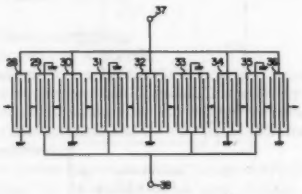
1. A microwave coupler device comprising: a substrate of dielectric material; a ground plane conductor on one main face of the substrate; and an electrically conductive pattern on the other main face of the substrate comprising a central portion in the form of a rectangle and four strip portions respectively extending from positions adjacent the corners of the rectangle, the strip portions being of equal widths, the dimension of the rectangle between its side extending between a first strip portion and an adjacent second strip portion and its opposite side exceeding the dimension of the rectangle between its other pair of opposite sides by substantially $\sqrt{2}$ times the width of the strip portions, the dimension of the rectangle between said other pair of opposite sides being substantially 0.46 times the wavelength of signals at the centre of the frequency band over which the coupler is required to operate in a transmission line formed by a said strip portion and the ground plane conductor, and the strip portions extending from positions at the ends of the longer sides of the rectangle with the sides of the strip portions at substantially 45° to the sides of the rectangle, the arrangement being such that with a dummy load connected between said first strip portion and the ground plane conductor, and input signal applied between said adjacent second strip portion and the ground plane conductor produces substantially equal amplitude, quadrature outputs between the third and fourth strip portions respectively and the ground plane conductor.

4,492,940

ACOUSTIC SURFACE-WAVE BANDPASS FILTER

Mitsutaka Hikita, Hachioji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 4, 1983, Ser. No. 463,959
Claims priority, application Japan, Mar. 10, 1982, 57-36410
Int. Cl.³ H03H 9/64, 9/145
U.S. Cl. 333—194 **5 Claims**



1. An acoustic surface-wave bandpass filter comprising a plurality of input transducers and a plurality of output transducers formed on a substrate and arrayed in the direction in which acoustic surface waves travel on said substrate, each of said input and output transducers having a plurality of interleaved metal electrodes, wherein the number of said interleaved metal electrodes of at least one of said input and output transducers is increased for the transducer located at the center portion of said array as compared with the transducers located at both end portions of said array.

4,492,941

CIRCUIT BREAKER COMPRISING PARALLEL CONNECTED SECTIONS

Harry H. Nagel, Westwood, N.J., assignor to Heinemann Electric Company, Lawrenceville, N.J.

Filed Feb. 18, 1983, Ser. No. 467,588
Int. Cl.³ H01H 75/00
U.S. Cl. 335—13 **11 Claims**

1. A single pole circuit breaker comprising at least two sections

each section comprising

an electromagnetic sensing means,

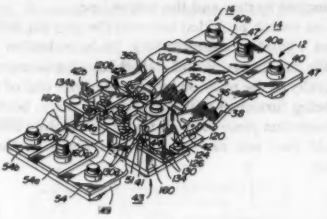
a set of relatively movable contacts, and

a mechanism for opening and closing said contacts in response to said electromagnetic sensing means,

all of said electromagnetic sensing means being connected in electrical parallel with each other at both of their electrical ends,

all of said sets of relatively movable contacts being connected in electrical parallel with each other at both of their electrical ends, and

all of said parallel connected electromagnetic sensing means being electrically connected in series with all of said sets of relatively movable contacts,



whereby the current through the two or more electromagnetic sensing means will be divided equally even though the current through the two or more sets of movable contacts may not be equally divided due to varying contact resistance.

4,492,942

ELECTRO-MAGNETIC RELAY

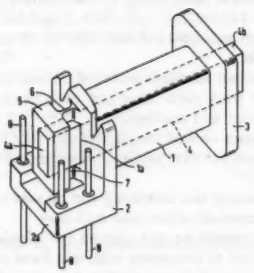
Erwin Mueller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 14, 1983, Ser. No. 475,225

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3213759

Int. Cl.³ H01H *67/02*

U.S. Cl. 335—202 **13 Claims**



11. An electro-magnetic relay, comprising: an excitation coil having a coil body with a flange; an armature having an armature retaining element attached to the flange via integral first and second elastic stays or supporting arms on respective opposite sides of a longitudinal axis of the armature; the armature extending along a winding axis of the coil and through an inner opening within the coil body; the elastic stays permitting a rotation of the armature and armature retaining element about an axis perpendicular to the coil winding axis; and the stays extending between the armature retaining element and flange in a direction of the longitudinal axis of the armature, and wherein the stays bend to permit said rotation.

4,492,943

DEVICE FOR DISPLAYING TELEVISION PICTURES AND DEFLECTION UNIT THEREFOR

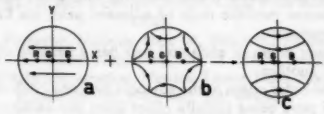
Albertus A. S. Sluyterman, and Nicolaas G. Vink, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 23, 1984, Ser. No. 583,069

Claims priority, application Netherlands, Feb. 28, 1983, 8300729

Int. Cl.³ H01F *5/02*

U.S. Cl. 335—213 **3 Claims**



1. In a device for displaying television pictures by means of a display tube in the neck of which a gun system is present for emitting at least one electron beam towards a display screen, and having an electromagnetic deflection unit which is disposed around a portion of the display tube and which comprises a first deflection coil for producing, when energized, a frame deflection field and a second deflection coil for producing when energized, a line deflection field, said second deflection coil being located coaxially within the first deflection coil, each deflection coil having two diametrically oppositely located coil units, the first deflection coil having a winding distribution for producing, upon energization, a dipole deflection field in combination with a positive sixpole deflection field on the side of the gun system, producing a dipole field in combination with a negative sixpole field in the central area, and producing a dipole field in combination with a positive sixpole field on the side facing the display screen, the improvement wherein the first and the second deflection coil are positioned in the axial direction relative to each other so that upon energisation the magnetic field generated by the first deflection coil extends farther towards the display screen than the magnetic field generated by the second deflection coil so that the device shows a minimum east-west raster distortion.

4,492,944

TRANSFORMER WINDING

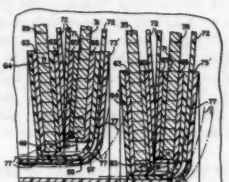
Yasuo Toba, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1983, Ser. No. 540,455

Claims priority, application Japan, Oct. 8, 1982, 57-177881

Int. Cl.³ H01F *15/14*

U.S. Cl. 336—69 **2 Claims**



1. A transformer, comprising:

a magnetic core having two windows separated by a winding leg having a longitudinal axis,

an electrical winding disposed about said winding leg,

said electrical winding having first and second ends, and a

winding axis which extends between its ends, with said winding axis being coaxial with the longitudinal axis of said winding leg,

said electrical winding including a plurality of pancake coils each having inner and outer ends and inner and outer peripheral edges, with portions of said inner and outer peripheral edges being adjacent to core portions, devoid of any intervening electrical winding,

said plurality of pancake coils being arranged in pairs,

means electrically interconnecting the inner ends of the pancake coils of each pair via start-start, connections,

means electrically interconnecting the outer ends of the adjacent pancake coils of adjacent pairs via finish-finish connections,

the inner edges of each coil pair being radially offset from one another,

and the outer edges of the adjacent pancake coils of adjacent coil pairs being radially offset from one another;

first insulative channel members disposed about the radially offset inner edges of each coil pair,

and second insulative channel members disposed about the radially offset outer edges of the adjacent pancake coils of adjacent coil pairs,

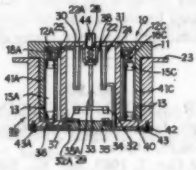
each of said first and second insulative members including a smoothly curved portion which extends between the edges of the associated pancake coils, resulting in the surfaces of said curved portions closely conforming to the equipotential planes of the dielectric field which exists adjacent to the inner and outer edges of the pancake coils.

4,492,945

SAFETY SOCKET WITH EASY FUSE REPLACEMENT DEVICE

W. F. Jou, 8, La. 18, Pao Yuan Rd., Sec. 2, Hsintien City, Taipei Hsien, and C. N. Chen, 4th Floor, No. 17, La. 411, Neihu Rd., Sec. 1, Taipei, both of Taiwan

Filed Sep. 21, 1982, Ser. No. 420,659
Int. Cl.³ H01H *85/14*
U.S. Cl. 337—229 **3 Claims**



1. A safety socket with easy fuse replacement device, comprising: a socket body, a cylinder projecting from the center of the fix board for the socket body with orificed fronts, a socket cylinder complete with frontal insertion slits as extended from the base of the cylinder, whose tail is apertured, an annular guidance to facilitate the suitable introduction of a hollow cylinder as formed between above mentioned cylinders, a first clip and a second clip as provided paralled and aligned to above mentioned slits in the socket cylinder, the second clip extended exposed outside the socket cylinder to form an arc conductor;

a hollow cylinder whose frontal end can be suitably sleeved over the annular guidance as provided in the socket body, the tail end of the hollow cylinder annexed with a swivel knob whose interior is equidistantly spaced to permit housing of a number of fuse containing holes, in each fuse containing hole there are loaded respectively conduction pieces that will extend outside of the hollow cylinder and effect apt engagement with arc conductor, to be executed by taking the dimension of the two arc conductors led from the two clips into account;

a base lid as mounted to the bottom of the cylinder body, on which lid there are provided two sets of joint contacts, the upper joint point for each set being connected to the power line by the medium of conducting wires, whereas the lower joint point for each set are each connected to the first and the second clips respectively by means of conducting bodies and the active fuse;

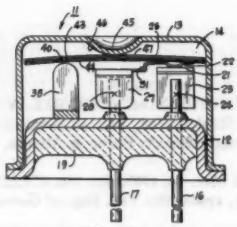
a push-on switch provided between the two slit holes of the socket cylinder, comprising a push-on button exposed outside the fix board and a shaft bar that is incorporated integrally to the push-on button, the front end of the shaft bar being furnished with an insulation piece, both ends of the insulation piece provided with conducting bits leading to said two sets of joint contacts going to the power source.

4,492,946

EDGE-ACTUATED THERMOSTAT

Michael R. Loescher, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Oct. 20, 1983, Ser. No. 543,619
Int. Cl.³ H01H *37/54*
U.S. Cl. 337—365 **19 Claims**



1. A thermostat comprising, in combination:

a base;

a metal cap mounted on said base to form an enclosure therewith;

first and second terminals mounted on said base in a manner insulated from each other and each having one end extending into said enclosure;

a fixed contact on said one end of said first terminal;

a resilient contact strip having a mounting end and a contact end;

means mounting said mounting end on said one end of said second terminal within said enclosure;

a movable contact on said contact end of said contact strip and adapted to cooperate with said fixed contact;

said contact strip having a resilient bias away from said fixed contact;

first and second supports on said base;

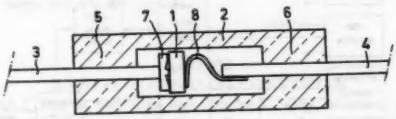
a thermostatic snap element having two positions of stability mounted on said two supports and on said contact end of said contact strip for a three-point support; and

a convex projection on the inside of the top of said cap adapted to engage a convex central region of said thermostatic snap element in one temperature condition thereof to establish contact pressure forcing said movable contact against said fixed contact, and whereby upon temperature change beyond a predetermined temperature said thermostat will snap to a condition concave toward the inside of said cap for an open circuit condition of said contacts as established by the resiliency of said contact strip.

4,492,947
RESISTOR HAVING A POSITIVE TEMPERATURE COEFFICIENT

Jean B. C. H. Staats, Stadskanaal, Netherlands, and Gabriël D. Declerck, Brussels, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 17, 1982, Ser. No. 389,187
Claims priority, application Netherlands, Jun. 29, 1981, 8103116
Int. Cl.³ H01C 7/02
U.S. Cl. 338—22 R **6 Claims**

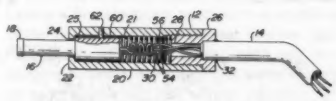


1. A positive temperature coefficient resistor comprising a generally tubular envelope, a plate-shaped resistance element having a positive temperature coefficient positioned within said envelope with the rotational axis thereof substantially parallel to the major axis of said envelope, two electrical conductors, each of said conductors making electrical contact with a separate major surface of said resistance element and each of said conductors extending out of an opposite end of said envelope, characterized in that at least one of said conductors has an end face opposed, and substantially parallel to a major surface of said resistance element and provided with outwardly extending portions bearing on, and forming an electrical contact with, a portion of the opposing major surface of said resistance element, said outwardly extending portions being radial strips whose height increases gradually from the center towards the end of the end face of said conductor.

4,492,948
FAST RESPONSE SURFACE CONTACT TEMPERATURE SENSOR

Wilson A. Clayton, LaHabra, and Alexander Galperin, Fullerton, both of Calif., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Sep. 2, 1981, Ser. No. 298,681
Int. Cl.³ H01C 3/04
U.S. Cl. 338—25 **10 Claims**



1. An improved surface temperature measuring probe comprising:

a support assembly having a body portion, a recessed chamber in one end thereof, and at least one passageway extending through said body portion;

an electrical temperature sensing element housed in said recessed chamber;

electrical signal leads connected to said electrical temperature sensing element and passing through said passageway;

a thin cap in intimate thermal contact with said electrical temperature sensing element closing said recessed chamber in said end and extending up the sidewall of said support assembly for a short distance exposing said thin cap to ambient conditions, said thin cap having a thermal conductivity substantially greater than the thermal conductivity of said support assembly and having an end surface area that is equal to the surface area of the portion extending up the sidewall;

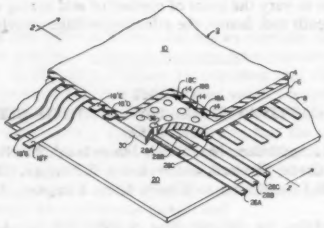
handle means telescopically holding said support assembly; and

spring means connected between said handle means and said support assembly whereby forces applied to said handle means are transmitted through said spring means to said support assembly.

4,492,949
TACTILE SENSORS FOR ROBOTIC GRIPPER AND THE LIKE

Robert R. Peterson, Hudson; Dale W. Schubert, Sudbury, and Peter N. Cholakis, Hopkinton, all of Mass., assignors to Barry Wright Corporation, Newton Lower Falls, Mass.

Filed Mar. 18, 1983, Ser. No. 476,685
Int. Cl.³ H01C 10/10
U.S. Cl. 338—114 **31 Claims**



1. A tactile sensor for sensing the pressure impressed by an object in contact therewith, said sensor comprising a sandwich having:

(a) a top layer comprised of a first flexible, electrically-insultating material and a plurality of first flexible, electrically-conductive rods disposed in parallel grooves in said first electrically-insulating material;

(b) a bottom layer secured to said top layer, said bottom layer being comprised of a second electrically-insulating material and a plurality of second electrically-conductive rods extending parallel to one another, said bottom layer being disposed relative to said top layer so that said first rods extend across and substantially parallel to said second rods; and

(c) an intermediate layer engaged by said top and bottom layers, said intermediate layer being comprised of a selected material that is both resilient and electrically-insulating and a plurality of mutually-spaced electrically-conductive posts disposed in and extending transversely through said selected material so that the opposite ends of said posts confront said top and bottom layers, said electrically-conductive posts being made of a resilient material and being disposed so that the axis of each post intersects one each of said first and second rods, whereby a matrix of electrically conducting paths is provided by said first and second rods and said posts.

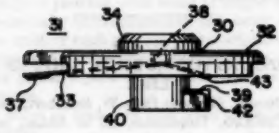
4,492,950
VARIABLE RESISTANCE ASSEMBLY WITH IMPROVED CONTACTOR KNOB

Stephen S. Simovits, Jr., Downers Grove, Ill., assignor to American Plasticraft Company, Chicago, Ill.

Filed Mar. 1, 1983, Ser. No. 470,993
Int. Cl.³ H01C 10/32
U.S. Cl. 338—162 **4 Claims**

1. A variable resistance assembly functioning as a voltage divider for a cathode ray tube comprising: an electrically nonconductive substantially flat substrate having terminal pads connectable to a source of voltage; an electrically-resistive

path on said substrate; a key slot adjacent said resistive path; a contactor assembly including a contactor knob, a resilient conductive spring mounted on said knob and having a portion engaging said resistive path, an L-shaped mounting post on said contactor, said post conforming to said key slot and extending therethrough from one surface to the opposite surface



of said substrates, the horizontal leg of said L-shaped post engaging the opposite surface of said substrate to retain said contactor on said substrate, and said contactor being rotatably adjustable to vary the point of contact of said spring with said resistive path and, hence, the effective voltage coupled therefrom.

4,492,951

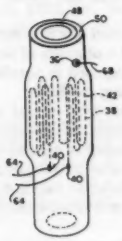
GLASS CAPTIVATED HEATING UNIT FOR STILL OR THE LIKE

Richard L. Apothaker, Northfield; James Reed, Newfield; Carmen L. Croce, Vineland, and Frederick B. Wagner, III, Elmer, all of N.J., assignors to Kontes Glass Company, Vineland, N.J.

Division of Ser. No. 241,055, Mar. 6, 1981, Pat. No. 4,334,904. This application Mar. 12, 1982, Ser. No. 357,790

Int. Cl.³ H01C *10/16*

U.S. Cl. 338—316 **15 Claims**



1. A glass captivated heating unit comprising a heating element of the type which expands when energized, from a normal to an expanded condition, a glass body having a channel therein, said element being freely received within said channel when said element is in the normal condition, said channel substantially conforming to the contours of, and being defined by the dimensions of said element, when said element is in said expanded condition.

4,492,952

AUTOMOTIVE DRIVING CONDITION ALARM SYSTEM

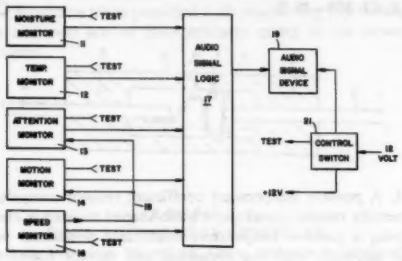
Albert J. Miller, Los Gatos, Calif., assignor to Atlas Electronics International, Santa Clara, Calif.

Filed Apr. 12, 1982, Ser. No. 367,340

Int. Cl.³ B60Q *1/00*

U.S. Cl. 340—52 F **9 Claims**

1. A vehicle driving condition monitoring system for warning of dangerous driving conditions, including sensor means mounted on the vehicle for detecting dangerous driving conditions, said sensor means including first sensor means for detecting excessive moisture on the road surface, second sensor means for detecting freezing temperature at the road surface, third sensor means for detecting excessive vibration of the vehicle in both horizontal and vertical directions, fourth sensor means for detecting excessive vehicular speed, and fifth sensor means for detecting drowsiness or inattention of the driver of the vehicle, said fifth sensor means including means for sensing lack of movement of the driver's hands on the steering wheel of the vehicle, comprising a pair of conductors wrapped about the steering wheel in non-connecting fashion, said conductors being connected in parallel with a RC timing network, frequency generator means connected to said timing network for generating an ac signal having a frequency which varies with the impedance of said timing network, means for sensing changes in said frequency of said ac signal, means for generating an alarm actuating signal in response to said predetermined changes in said ac signal, and alarm means connected to said sensors for emitting audible and visible alarm signals to the driver.



4,492,953

METHOD AND APPARATUS FOR CODING PULSE-AMPLITUDE MODULATED SIGNALS INTO PULSE-CODE MODULATED SIGNALS IN ACCORDANCE WITH AN APPROXIMATED LOGARITHMIC CHARACTERISTIC CURVE

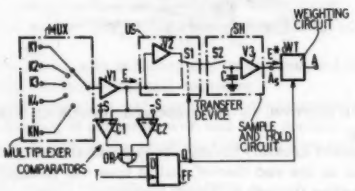
Max Rathgeber, Taufkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 1, 1982, Ser. No. 383,978

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1981, 3127600

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 AD **8 Claims**



1. In a process for coding pulse amplitude modulated signals into pulse code modulated signals, in accordance with an approximated logarithmic coding characteristic curve having a dynamic region which is sub-divided into a plurality of segments each having linear coding, in which process a first predecision is performed which is dependent upon the amplitude of an input signal of a maximum value $E = \pm 2048$ and subjects signals above or below a first threshold value to an amplitude transmission, the improvement therein comprising the step of:

given a thirteen segment characteristic, setting the first threshold value for positive and negative values between

128/2048 and 256/2048 of the maximum input signal E=±2048 and selecting a partial coding characteristic curve from the characteristic curve having companded input values E*;

amplifying input signals of less than the first threshold value by the factor 8; setting a second pre-decision at a second threshold value of between 16/256 and 32/256 of the maximum companded input value E*=±256 to divide the dynamic region of the partial coding characteristic curve into upper and lower subregions; and weighting the amplitude transformed signals falling into the upper and lower subregions with the same number of weighting steps to code the signals.

4,492,954

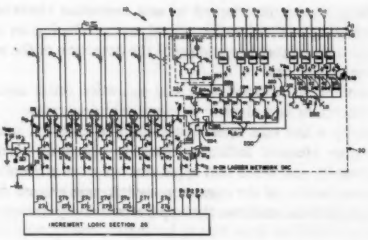
DIGITAL-TO-ANALOG CONVERTER

David J. Harris, San Jose, and Charles L. Vian, Milpitas, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 334,190, Dec. 24, 1981, abandoned. This application May 11, 1984, Ser. No. 608,928

Int. Cl.³ H03K *13/05*

U.S. Cl. 340—347 DA **12 Claims**



1. A digital-to-analog converter for producing an output current through an output bus, such current having a level related to a digital word, comprising:

(a) a first converter section fed by a first portion of the digital word for electrically coupling, or decoupling, a selected one, or ones, of a plurality of equal current sources to, or from, the output bus selectively in accordance with the first portion of the digital word, such first converter section, comprising:

(i) a plurality of switching transistors, each one thereof having a first electrode coupled to a corresponding one of the plurality of equal current sources; and

(ii) a plurality of resistor means, each one thereof being coupled between the output bus and a second electrode of a corresponding one of the plurality of switching transistors;

(b) a second converter section fed by a second portion of the digital word, for electrically coupling, or decoupling, a selected one, or ones, of a plurality of binarily weighted current sources to, or from, the output bus selectively in accordance with the second portion of the digital word, such plurality of binarily weighted current sources, comprising:

(i) a plurality of current source transistors; and

(ii) a resistor ladder network having resistors disposed in rungs thereof, such resistors being connected to emitter electrodes of the current source transistors; and

(c) wherein the resistances of the plurality of resistors of the first converter section are selected to produce a voltage drop across each one thereof equal to a voltage drop produced by one of the binarily weighted current sources across one of the resistors in the rungs of the resistor ladder network.

4,492,955

BATTERY VOLTAGE DROP ALARM DEVICE FOR A BATTERY FORKLIFT TRUCK

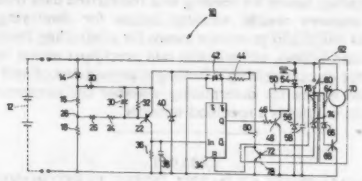
Toru Kubota, Koganei; Masazi Tamate, Musashino, and Masaaki Sauzu, Fuchu, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 18, 1983, Ser. No. 476,717

Claims priority, application Japan, Mar. 26, 1982, 57-47259

Int. Cl.³ G08B *21/00*; G01R *31/36*; H02J *7/00*

U.S. Cl. 340—636 **9 Claims**



1. In a battery forklift truck having an auxiliary movement apparatus, a battery voltage drop alarm device for alarming the necessity of charging a battery by detecting that the battery voltage drops to less than a prescribed value, comprising:

(a) battery voltage drop detecting means for generating an alarm instruction signal by detecting that the voltage of said battery drops to less than a prescribed voltage value;

(b) alarm means for generating an alarm signal according to the alarm instruction signal generated from said battery voltage drop detecting means; and

(c) alarm cut off means connected to an auxiliary work switching means for supplying an electric power from the battery to the auxiliary movement apparatus and also connected to said alarm means, said alarm cut off means being provided for stopping the alarm operation of said alarm means when the auxiliary work switching means supplies the electric power to the auxiliary movement apparatus.

4,492,956

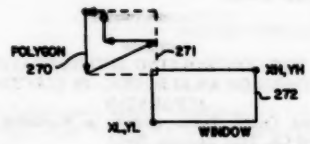
GRAPHICS DISPLAY SYSTEM AND METHOD INCLUDING PRECLIPPING CIRCUIT

Arthur J. Collmeyer, Saratoga; Jeffrey H. Hoel, Sunnyvale; Paul F. King, LaJolla; Donald O. Stanley, San Jose, and Roger Sturgeon, Santa Cruz, all of Calif., assignors to Calma Company, Sunnyvale, Calif.

Division of Ser. No. 125,843, Feb. 29, 1980, abandoned. This application Sep. 13, 1982, Ser. No. 417,684

Int. Cl.³ G09G *1/16*

U.S. Cl. 340—723 **17 Claims**



1. A graphics display system comprising vector memory means for storing vector data representing one or more graphics images to be displayed, wherein said vector data represents one or more polygons where each polygon representation includes header information specifying the format of said representation and where each polygon includes line segments having at least one vertex, memory update means including means for inserting said vector data into said vector memory means, means for modifying said vector data within said vector memory means, and preclipper means for retrieving said vec-

tor data from said vector memory means, clipper means for clipping specified ones of said polygons and for identifying specified ones of said polygons by a closest point, by a closest segment, and by partial or complete containment within a window, scaler means for translating and scaling ones of said polygons thereby transforming the image to be displayed, raster memory means, writing means for rasterizing the transformed vector data into said second memory means thereby forming raster data, reading means for reading said rasterized data from said raster memory means thereby forming raster data, reading means for reading said reasterized data from said raster memory means, monitor means for displaying said graphics image and processor means for controlling the operation of said system, and wherein said preclipper means include means for circumscribing a rectangle around one of said polygons and means for determining whether the circumscribed rectangle intersects a specified window.

4,492,957

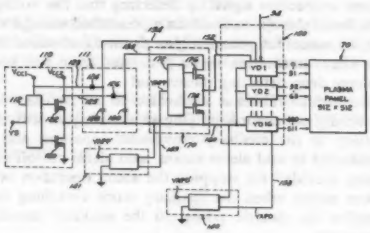
PLASMA DISPLAY PANEL DRIVE ELECTRONICS IMPROVEMENT

Michael J. Marentic, Orange, Calif., assignor to Interstate Electronics Corporation, Anaheim, Calif.

Filed Jun. 12, 1981, Ser. No. 272,885

Int. Cl.³ G09G *3/28*

U.S. Cl. 340—777 **16 Claims**



1. A circuit for a plasma panel comprising:

an intergrated circuit comprising:

a first pair of transistors, connected in totem pole, between a first terminal and a second terminal, said pair of transistors alternatively conductive to alternatively connect an output line to said first terminal or to said second terminal;

a second pair of transistors, outside of said intergrated circuit, connected in totem pole between said first terminal and a voltage source, said second pair of transistors alternatively conductive to alternatively connect said second terminal to said first terminal or to said voltage source.

4,492,958

DEVICE FOR CONTROLLING AND DISPLAYING THE FUNCTIONS OF AN ELECTRIC OR ELECTRONIC APPARATUS

Eiji Minami, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 15, 1982, Ser. No. 368,842

Claims priority, application Japan, Apr. 22, 1981, 56-61605; May 13, 1981, 56-71701; Jul. 30, 1981, 56-120322

Int. Cl.³ H04Q *9/00*; G08B *5/36*

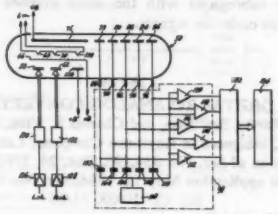
U.S. Cl. 340—825.25 **12 Claims**

1. A display apparatus having an operational control for use in an electric or electronic apparatus, comprising:

a display device having a housing made of non-conductive material for displaying an indication that an operating switch is actuated and for displaying an indication that said electric or electronic apparatus is in operation, said operating switch including at least one operation electrode disposed within said housing so that an activation signal can be produced in response to a capacitor produced between said operation electrode and a stimulus external to said housing;

a first display disposed within said housing for indicating that the operating switch is activated;

a second display element disposed within said housing for indicating that said apparatus is in operation, said operation electrode, first display element and second display element being enclosed within the housing;



a detection circuit coupled to said operation electrode for detecting said activation signal and producing an operation order signal in response to the detection of the activation signal; and

control means responsive to said operation order signal for controlling said electric or electronic apparatus;

whereby when said operation switch is actuated, said first display element indicates that the operating switch is actuated, and when said apparatus operates in response to the actuation of the operation switch, said second display element indicates that the apparatus is in operation.

4,492,959

KEYLESS ENTRY SYSTEM FOR AN AUTOMOTIVE VEHICLE

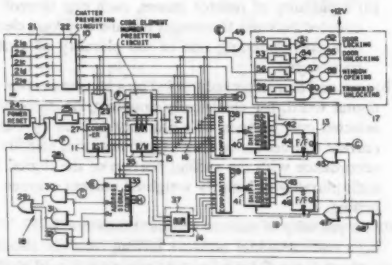
Haruo Mochida, Yokohama; Hiroshi Nakakooji, Zama, and Hirotoshi Namazue, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited and Kokusan Kinzoku Kogyo Co., Ltd., both of, Japan

Filed Jun. 23, 1982, Ser. No. 391,343

Claims priority, application Japan, Jun. 24, 1981, 56-96753; Jun. 24, 1981, 56-96754

Int. Cl.³ E05B *49/00*; H04Q *9/00*

U.S. Cl. 340—825.56 **14 Claims**



1. A keyless entry system for unlocking an automotive door lock in use with a code inputted thereto, which comprises:

an input unit for inputting an input code;

a first memory means for storing a first code;

a second memory means for storing a second code having a given number of code elements, the number being variable

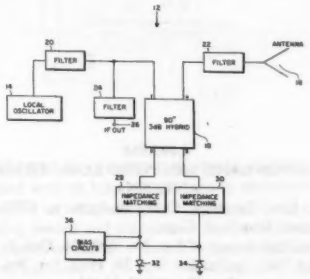
in a range limited by a predetermined maximum number; and

a third means, responsive to an inputted first code through said input unit, for enabling variation of said second code and for varying said number of code elements, said third means being adapted to record the varied second code in said second memory means.

4,492,960
SWITCHING MIXER

Alfred R. Hialop, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 18, 1982, Ser. No. 340,397
Int. Cl.³ G01S 9/00
U.S. Cl. 343—5 DD **6 Claims**



1. A switching mixer comprising:

a local oscillator having an input and an output;

first filter means connected to said local oscillator output for passing RF signals and signals from said local oscillator and for blocking intermediate frequency signals and having an input and an output;

a hybrid coupler having a first port connected to said output of said first filter means and also having second, third and fourth ports;

first and second impedance matching networks each having a first terminal connected respectively to said hybrid coupler second and third ports and each said impedance matching network having a second terminal;

first and second mixer diodes, each being connected to a respective second terminal of one of said first and second impedance matching networks;

diode bias network means connected to said first and second mixer diodes for variably adjusting the amount of bias to said first and second mixer diodes;

second filter means connected to said hybrid coupler for passing intermediate frequency signals; and

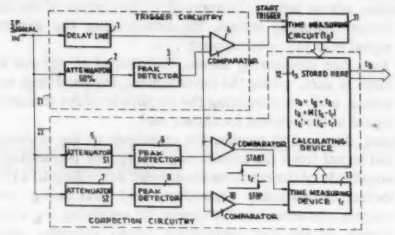
third filter means connected to said hybrid coupler fourth port for passing RF signals and signals from said local oscillator and for blocking intermediate frequency signals.

4,492,961
SYSTEM FOR DERIVING PRECISE INSTANTS OF TRIGGERING OF A PULSED DEVICE

Wilhelm J. Koller, Brunswick, and Horst Vogel, Korntal, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 241,603, Mar. 9, 1981, abandoned. This application Jun. 24, 1983, Ser. No. 507,372
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 3009651
Int. Cl.³ G01S 13/70, 7/40
U.S. Cl. 343—7.3 **1 Claim**

1. A distance measuring equipment (DME) system comprising: an interrogator; a transponder, said interrogator and transponder each including cooperating transceivers to measure the distance from said interrogator to said transponder, said interrogator including first means for producing a first signal proportional to the time elapsed t_g between a start trigger and a first invariant percent of the leading edge of a received pulse; second means for producing a second signal proportional to the time elapsed t_r between the occurrence of second and third different invariant percents of the leading edge of a received pulse, said second and third percents being respectively smaller and larger than said first percent, respectively; and third means



for producing an output signal proportional to a time t_b which is, in turn, proportional to the distance between said interrogator and said transponder,

where

$$t_b = t_g + t_k$$

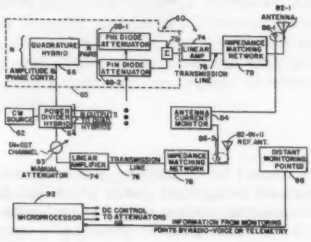
$$t_k = M(t_g - t_r)$$

M is a constant, and t_r is a constant.

4,492,962
TRANSMITTING ADAPTIVE ARRAY ANTENNA

Peder M. Hansen, 655 Savoy St., San Diego, Calif. 92106

Filed Aug. 31, 1981, Ser. No. 297,598
Int. Cl.³ G01S 5/02
U.S. Cl. 343—369 **2 Claims**



TRANSMITTING ADAPTIVE ARRAY

1. An adaptive array system comprising N+1 channels for transmitting a signal, where N is some positive integer, comprising:

means for generating a continuous-wave (C-W) signal, having a predetermined amount of power;

means having N+1 outputs, whose input is connected to the output of the generating means, for dividing the power of the signal received at its input between the N+1 outputs;

a plurality of N means, whose signal inputs are connected to N of the outputs of the power dividing means, for controlling amplitude and phase for each of the N channels, said controlling means also having inputs for receiving d-c control signals;

means whose input is connected to an output of the power

dividing means for providing a reference phase and amplitude for the adaptive system;

a plurality of N+1 means, whose inputs are connected to the outputs of the amplitude and phase control means and of the reference means, for linearly amplifying its input signal;

a plurality of N+1 means, whose inputs are connected to the output of the linear amplifying means, for matching the impedance at their inputs to the impedance at their outputs;

means, whose input is connected to the output of the impedance matching means, for transmitting the generated signal into the environment;

at least one monitoring means, distributed at various locations or sites, within the environment, for receiving, monitoring, and retransmitting the amplitude of the transmitted signal at the several locations; and

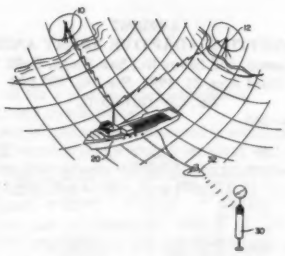
means, disposed to receive the amplitude of the retransmitted signal from the monitoring means, for processing the amplitude of the retransmitted signal according to a preselected optimization algorithm, said processing means outputs connected to the inputs for receiving d-c control signals of the d-c controlling means whereby control signals are relayed to cause the controlling means to readjust phase and amplitude levels for each of the N channels.

4,492,963

METHOD AND APPARATUS FOR DETERMINING LANE COUNT ERROR IN A RADIO NAVIGATIONAL SYSTEM

Richard I. Scarlet, Boxborough, Mass.; James B. Andrews, Nashua, N.H., and William F. Henning, II, Annandale, Va., assignors to EG&G, Inc., Wellesley, Mass.

Filed Oct. 5, 1983, Ser. No. 538,822
Int. Cl.³ G01S *3/02*
U.S. Cl. 343—464 **7 Claims**



1. A method for determining lane count error, if any, in a conventional navigational system which includes at least two fixed transmitting stations and a first navigation instrument on a vessel and which gives the position of a vessel in an integer and fractional lane count format but has an inherent integer lane count ambiguity, the method comprising:

(1) surveying an element to determine its known depth and position relative to the fixed transmitting stations;

(2) positioning a second navigation instrument on the vessel, said second navigation instrument being capable of determining the distance R between the surveyed element and the vessel;

(3) moving the vessel from a position S_1 to a position S_2 and taking readings from the first and second navigational instruments to obtain data representing at least (a) the actual distances R_1 and R_2 between the surveyed element and the positions S_1 and S_2, respectively, and (b) the integer and fractional lane count readings, as given by the conventional navigational system, for the positions S_1 and S_2;

(4) calculating from the known position and depth of the element, the known distances R1 and R2, and the known integer and fractional lane count readings, the mathematically possible mirror image positions of at least S_1 and S_2 relative to the element, one set of mirror image positions S_1 and S_2 representing the actual position of the vessel and the other set of mirror image positions S_1' and S_2' representing false positions of the vessel; and

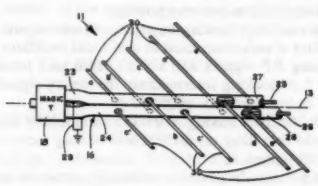
(5) comparing the calculated possible mirror image positional information with the information provided by one or the other of the first and second navigational instruments to determine the actual position of the vessel, and thereby determine the lane count error in the conventional navigational system.

4,492,964

GROUNDPLANE MOUNTED LOG-PERIODIC ANTENNA

Samuel C. Kuo, Saratoga, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 309,874, Oct. 9, 1981, abandoned. This application Sep. 29, 1983, Ser. No. 537,778
Int. Cl.³ H01Q *11/10*
U.S. Cl. 343—792.5 **17 Claims**



1. A log-periodic dipole antenna comprising:

a ground plane,

an array of radiating elements, said array having an axis and comprising first and second sets of said elements, each of said sets of elements having an axis, the elements of each set having lengths and interelement spacings decreasing axially from a maximum at one end to a minimum at the other end in increments at a predetermined ratio, adjacent elements of each set extending on opposite sides of the axis of the set and forming dipoles, and

balanced feed means for energizing said elements comprising first and second lines and means to shield said lines, said shield means being connected to the ground reference potential of the ground plate,

the elements of said first set being connected to said first line and the elements of said second set being connected to said second line,

each element of said first set having a length equal to the length of a corresponding element of said second set and being axially spaced from said other end by the same distance as said corresponding element, with elements of equal length of said sets extending in opposite directions,

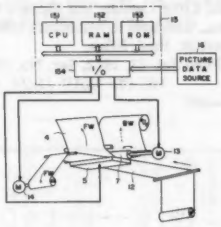
said array being located over said ground plane for creating a mirror image,

said array elements being arranged in an E-plane, in a frequency independent manner, and to be coplanar with corresponding mirror image elements.

4,492,965
THERMAL TRANSFER PRINTING METHOD

Masaru Ohnishi, and Masayuki Saito, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1983, Ser. No. 494,283
Claims priority, application Japan, May 24, 1982, 57-89074; Sep. 24, 1982, 57-167268
Int. Cl.³ G01D *15/10, 15/34;* B41J *35/18*
U.S. Cl. 346—1.1 11 Claims



1. A thermal transfer printing method using at least one ink sheet provided with at least one thermally transferable solid ink layer formed on a base film as a donor medium, said solid ink layer being heated and transferred onto a record medium whereby picture elements of a picture to be printed are printed on the record medium,

the optical reflection density of said solid ink layer being smaller than the maximum value of the optical reflection density of said picture elements,

said method comprising at least:

a first step of printing at least one picture element out of said picture elements by moving said record medium and said ink sheet in a forward direction so that said solid ink layer is transferred onto said record medium,

a second step of returning said record medium in a state before said first step, and

a third step of transferring said solid ink layer in an overlapping manner to the picture element printed in said first step, by moving said record medium and said ink sheet again in the forward direction after said second step.

4,492,966
RECORDING APPARATUS

Mitsuaki Seki, Machida; Shigemitsu Tazaki, Matsudo, and Yoshiaki Shirato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

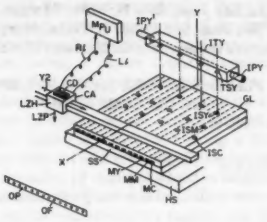
Continuation of Ser. No. 407,090, Aug. 11, 1982, abandoned, which is a continuation of Ser. No. 135,192, Mar. 28, 1980, abandoned. This application Mar. 16, 1984, Ser. No. 589,870
Claims priority, application Japan, Apr. 2, 1979, 54-39475
Int. Cl.³ G01D *5/26, 15/16*
U.S. Cl. 346—33 A 13 Claims

1. Recording apparatus, comprising:

a recording unit having a plurality of dot forming means disposed in a plane, each of said dot forming means having an axis in the plane;

a carriage movable incrementally in a direction normal to the plane of dot forming means; and

a laser generating means mounted on said carriage and having a semiconductor for selectively irradiating any of said dot forming means with a laser pulse emitted in a direction

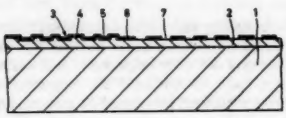


substantially perpendicular to the respective axis of each said dot forming means.

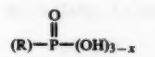
4,492,967
OPTICAL RECORDING DISC

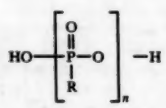
Dirk J. Broer, and Adriaan W. De Poorter, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 10, 1983, Ser. No. 456,878
Claims priority, application Netherlands, Nov. 5, 1982, 8204292
Int. Cl.³ G01D *15/34*
U.S. Cl. 346—135.1 5 Claims



1. In an optical recording disc in which information can be written and read optically comprising a substrate having a synthetic resin surface and an ablative recording layer situated on said synthetic resin surface, the improvement wherein said synthetic resin surface comprises an organic phosphorous compound of the formula:


I


II

wherein

R is an alkyl group or an alkoxy group having 1 to 18 carbon atoms which may be ethoxylated,

X has the value 1 or 2,

N has the value 2–10, and

M has the value 0–10.

4,492,968

DYNAMIC CONTROL OF NONLINEAR INK PROPERTIES FOR DROP-ON-DEMAND INK JET OPERATION

Francis C. Lee, San Jose; Ross N. Mills, Morgan Hill; Tiefu K. Niweigha, San Jose, and Frank E. Talke, Morgan Hill, all of Calif., assignors to International Business Machines, Armonk, N.Y.

Filed Sep. 30, 1982, Ser. No. 431,407
Int. Cl.³ G01D 15/16
U.S. Cl. 346—140 R 9 Claims

1. A drop-on-demand ink jet printing apparatus comprising a print head having an electromechanical transducer operable, when actuated, to eject a drop of ink, means for generating drop ejecting voltage drive pulses of at least a predetermined amplitude, said voltage drive pulses being selectively produced at a predetermined regularly recurring drop production rate, and means for coupling said drop ejecting voltage drive pulses to said transducer to actuate said transducer to produce one ink drop in response to each of said drop ejecting voltage drive pulses, the improvement comprising:

means to produce a series of voltage excitation pulses, said voltage excitation pulses having a predetermined repetition rate and an amplitude small with respect to said predetermined amplitude;

means for relatively timing said voltage excitation pulses with respect to said drop ejecting voltage drive pulses at said predetermined drop production rate so that said voltage excitation pulses drive said transducer during the intervals between said drop ejecting voltage drive pulses; and

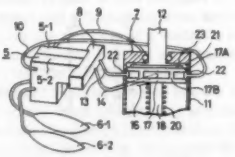
means for coupling said voltage excitation pulses to continuously actuate said transducer so that a pressure wave is propagated in the ink in response to said voltage excitation pulses to maintain dynamic ink characteristics constant and thereby prevent misplaced or missing ink drops after an idle period.

4,492,969

CAPPING DEVICE FOR A MULTI-INK JET HEAD

Koji Terasawa, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1982, Ser. No. 432,438
Claims priority, application Japan, Oct. 8, 1981, 56-160426; Oct. 14, 1981, 56-162768
Int. Cl.³ G01D 15/18
U.S. Cl. 346—140 R 13 Claims



1. A suction device for a multi-ink jet head comprising:

means for airtightly closing the respective fore ends of a plurality of nozzles provided in such a head to jet inks of respective different colors;

suction means for sucking the closed nozzle ends;

a plurality of ink suction channels disposed between said closing means and said suction means and connecting said closing means and said suction means, wherein each of said channels is provided for a respective ink color and wherein said suction means prevents ink from one of said channels from entering another of said channels during suction; and

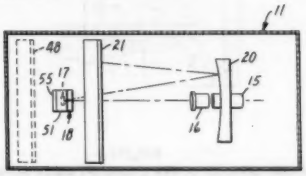
means for preventing the different color inks from being mixed together when said suction means is not in operation, by blocking off said ink suction channels when said suction means is not in operation for suction.

4,492,970

LASER DIODE PRINTER

Charles C. Lee, Little Canada, and Richard Owen, St. Anthony, both of Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Jul. 22, 1982, Ser. No. 400,638
Int. Cl.³ G01D 15/14
U.S. Cl. 346—160 12 Claims



1. An imaging device for use with an electrophotographic printer to print graphic information on a web of customary width comprising

a laser diode source for producing monochromatic radiation,

condensing lens for collecting radiation from said source and forming a beam,

a compound curved reflector positioned along said path for imaging radiation from the laser diode onto a flat field, and

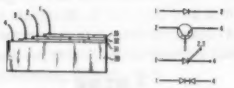
scanning means for moving the beam across a path traverse to said beam.

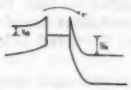
4,492,971

METAL SILICIDE-SILICON HETEROSTRUCTURES

John C. Bean, New Providence, N.J.; Kin-Chung R. Chiu, Mountain View, Calif., and John M. Poate, Summit, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 5, 1980, Ser. No. 156,649
Int. Cl.³ H01L 29/48
U.S. Cl. 357—15 7 Claims





1. Article comprising a composite structure of:

a single crystal silicon substrate,

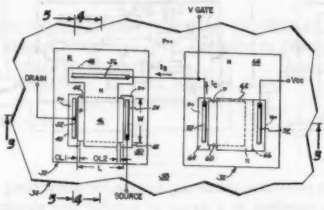
a single crystal metal silicide layer overlying the silicon substrate,

and a single crystal silicon layer overlying the metal silicide, said composite structure having an essentially continuous single crystal lattice between the three layers.

4,492,972
JFET MONOLITHIC INTEGRATED CIRCUIT WITH INPUT BIAS CURRENT TEMPERATURE COMPENSATION

James L. Gorecki, Plymouth, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 17, 1981, Ser. No. 293,436
Int. Cl.³ H01L *29/48, 29/06*
U.S. Cl. 357—22 27 Claims



1. A gate-channel reverse leakage current compensated junction field effect transistor (JFET) monolithic integrated circuit comprising:

a JFET having a drain region of first conductivity type, a source region of first conductivity type, a channel region of first conductivity type extending between the drain region and the source region, and a first gate region of second conductivity type adjacent the channel region, the first gate region and the channel region defining a first gate/channel junction of a first junction area which junction exhibits a reverse leakage current;

a compensation device having a first region of first conductivity type formed concurrently with the channel region of the JFET and a second region of second conductivity type adjacent the region of first conductivity type and formed concurrently with the first gate region of the JFET, the first and second regions of the compensation device defining a first compensation junction of a second junction area which junction exhibits a reverse leakage current, the first junction area having a predetermined relationship with the second junction area; and

means for electrically connecting the first region of first conductivity type of the compensation device and the first gate region of the JFET so that the reverse leakage current of the compensation device tends to compensate the reverse leakage current of the JFET.

4,492,973
MOS DYNAMIC MEMORY CELLS AND METHOD OF FABRICATING THE SAME

Mitsugi Ogura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 104,866, Dec. 18, 1979, abandoned. This application Dec. 30, 1981, Ser. No. 335,601
Claims priority, application Japan, Dec. 25, 1978, 53-158709; Dec. 25, 1978, 53-158710
Int. Cl.³ H01L *29/78, 27/02, 29/04;* G11C *11/24*
U.S. Cl. 357—23 10 Claims

1. A MOS (Metal Oxide Semiconductor) dynamic memory cell comprising:

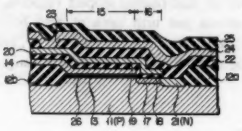
a semiconductor substrate of a first conductivity type having a first semiconductor region of a low impurity concentration;

a first electroconductive layer formed on a first insulating film provided on the surface of said first semiconductor region;

a second semiconductor region of the first conductivity type formed in said semiconductor substrate by implanting ions by using said first electroconductive layer as a mask and having one end contacting one end of the surface region of said first semiconductor region, said second semiconductor region having a higher impurity concentration than that of said first semiconductor region;

a second electroconductive layer formed on a second insulating layer provided on the surface of said second semiconductor region and extended along a third insulating layer provided on said first electroconductive layer;

a third semiconductor region formed in said semiconductor substrate and having one end in contact with the other end of said second semiconductor region, said third semiconductor region having a second conductivity type and being in contact also with a portion of the substrate, said portion hving the same impurity concentration as said first semiconductor region;



means for applying different potentials to said third semiconductor region and to said first and second electroconductive layers;

an inversion layer being formed in said surface region of said first semiconductor region by two means in which one means includes means for applying a voltage between said first electroconductive layer and said semiconductor substrate and the other means includes the impurity concentration of said first semiconductor region being at less than 5×10^{14} cm^{-3};

one end of said inversion layer adjacent to said second semiconductor region and one end of said first electroconductive layer adjacent to said second semiconductor region being aligned with each other;

said one end of said inversion layer and the corresponding end of said second semiconductor region being closely contacted with each other; and

said inversion layer being used as a depletion mode MOS capacitor.

4,492,974
DMOS WITH GATE PROTECTION DIODE FORMED OVER BASE REGION

Isao Yoshida; Takeaki Okabe, both of Nishitama; Mineo Katsueda, Hachioji; Minoru Nagata, Kodaira; Toshiaki Masuhara, Nishitama; Kazutoshi Ashikawa; Hideaki Kato, both of Takasaki; Mitsuo Ito, Gunma; Shigeo Ohtaka, Takasaki; Osamu Minato, Kodaira, and Yoshio Sakai, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 22, 1982, Ser. No. 350,589
Claims priority, application Japan, Feb. 27, 1981, 56-26797
Int. Cl.³ H01L *29/78, 29/90, 27/02;* H02H *3/20*
U.S. Cl. 357—23 15 Claims

1. A semiconductor integrated circuit device comprising:

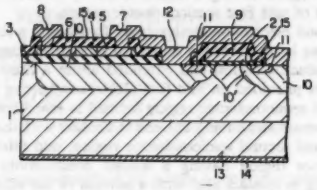
a semiconductor body;

a semiconductor element formed in said semiconductor body;

a semiconductor region formed in a surface region of said semiconductor body and having an opposite conductivity type to that of said semiconductor body; and

a protection element for protecting said semiconductor

element, said protection element being formed in a semiconductor layer provided on an insulating film situated on said semiconductor region, said protection element including a pair of highly doped regions and a low doped region in such a manner that said low doped region is sandwiched between said highly doped regions and that a



pn junction is formed between said low doped region and at least one of said highly doped regions, the number of impurity atoms per unit area at said low doped region being in a range from 10^{13} to 10^{15} cm^{-2}, and the thickness of said low doped region being in a range from 0.1 to 1 μm.

4,492,975

GATE TURN-OFF THYRISTOR STACK

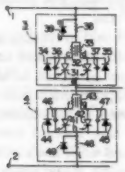
Yukio Yamada; Hiroshi Itahana, and Hisashi Kuwana, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

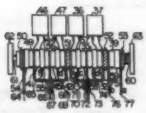
Filed Jul. 8, 1982, Ser. No. 396,377

Claims priority, application Japan, Jul. 10, 1981, 56-107100

Int. Cl.³ H01L *23/32, 23/42, 25/04;* H03K *17/60*

U.S. Cl. 357—76 **5 Claims**





1. A gate turn-off thyristor stack comprising:

a set of two flat type gate turn-off thyristor elements and a set of two diode elements which sets are stacked with a stacking structure in which the two elements in one set of said thyristor and diode element sets are located at the middle of the stacking structure and sandwiched between the two elements of the other set, said stacking structure having means for electrically connecting said two thyristor elements in parallel with each other and electrically connecting said two diode elements in antiparallel with said two thyristor elements respectively; and

a pair of clamper members provided through insulating members at opposite outer sides of said stacking structure respectively for clamping said stacking structure.

4,492,976

LINE STANDARD CONVERSION CIRCUIT FOR A TELEVISION SIGNAL

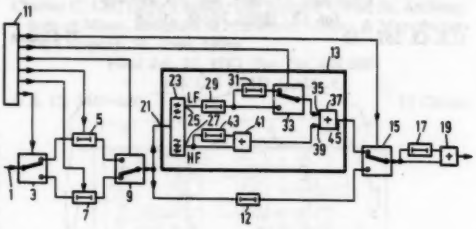
Marinus C. W. vanBuul, Breda; Johannes G. Raven, and Wilhelmus H. C. A. van de Ven, both of Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 10, 1982, Ser. No. 416,736

Claims priority, application Netherlands, Oct. 6, 1982, 8104532

Int. Cl.³ H04N *9/42*

U.S. Cl. 358—11 **8 Claims**



1. In a television receiving system for converting a signal of one line standard to a signal of another line standard, a field delay circuit connected to receive said signal of one line standard comprising:

a separation circuit for dividing said signal of one line standard signal into a high frequency and a low frequency signal;

first means for processing said low frequency signal to have a delay during one field different than the delay of a subsequent field;

second processing means independent of said first processing means for receiving said high frequency signal; and

means for combining signals from said first and second processing means to provide a combined video signal.

4,492,977

PHOTOMULTIPLIER TUBE DEVICE

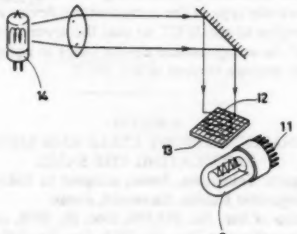
Masaya Tsuda; Ken-Ichi Yonemaru, both of Kyoto, and Yoshikazu Masuda, Ibaraki, all of Japan, assignors to Dainippon Screen Manufacturing Co., Ltd., Kyoto, Japan

Filed Jul. 19, 1982, Ser. No. 399,525

Claims priority, application Japan, Jul. 23, 1981, 56-110170[U]

Int. Cl.³ H04N *1/46*

U.S. Cl. 358—75 **5 Claims**



1. In an electronic color separation system having a photomultiplier tube device in the scanning unit thereof for producing electrical color separation signals in response to light received from color separation means, the improvement wherein said scanning unit comprises a halogen lamp as a light source, and said photomultiplier tube device comprises light diffuser plate means positioned and oriented in the light path from said halogen lamp in the vicinity of a photomultiplier tube for diffusing light from said halogen lamp to ensure that a uniform

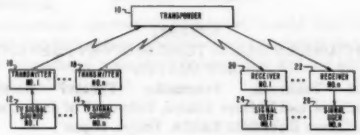
amount of diffused light impinges on the photomultiplier tube whereby the image of filaments from said halogen lamp is diffused eliminating the requirement of precise adjustment of the positioning of the photomultiplier tube.

4,492,978

TRANSMISSION SYSTEM FOR TV SIGNALS

Leslie D. Thomas, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 12, 1979, Ser. No. 19,987
Int. Cl.[3] H04N 7/12
U.S. Cl. 358—134 9 Claims



1. A system for simultaneously transmitting and simultaneously receiving a plurality of signals via a common transponder comprising:

(1) a plurality of transmitting stations, each including:

(a) means for sampling a signal to be transmitted at a predetermined sampling rate to generate a plurality of digital data words, each of said data words being indicative of the magnitude of the sampled signal;

(b) memory means for storing said plurality of digital words;

(c) memory read means for reading said stored digital data words at a rate less than said sampling rate to produce a data stream comprising said digital data words at the output of said memory means;

(d) circuit means responsive to said data stream to produce a compressed signal having a bandwidth less than the bandwidth of the original signal;

(e) transmitting means for producing a respective first carrier modulated by said compressed signal;

(f) a transponder responsive to said respective first carrier to produce a respective second carrier modulated with said compressed signal;

(2) a plurality of receiving stations, each including:

(a) a receiving means tuned to said respective second carrier, said receiving means also including demodulating means for recovering said compressed signal from said respective second carrier, said compressed signal being available at the output terminal of said receiving means;

(b) digital sampling means for sampling said compressed signal at a preselected rate to produce a plurality of digital data words;

(c) memory means for storing said plurality of digital data words;

(d) memory read means for reading said stored digital data words at a rate higher than said preselected rate to produce a data stream comprising a plurality of digital words; and

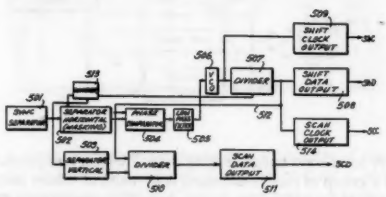
(e) circuit means responsive to said data stream to produce a reconstructed signal having the same bandwidth as said signal to be transmitted.

4,492,979

SYNCHRONIZING CIRCUIT FOR MATRIX TELEVISION SET

Masayuki Ikeda, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Division of Ser. No. 295,192, Aug. 21, 1981, Pat. No. 4,393,405.
This application May 24, 1983, Ser. No. 497,622
Claims priority, application Japan, Aug. 22, 1980, 55-116278
The portion of the term of this patent subsequent to Jul. 12, 2000, has been disclaimed.
Int. Cl.[3] H04N 5/04, 5/08
U.S. Cl. 358—153 4 Claims



1. In a synchronizing circuit for a matrix television set having display means including picture elements arranged in a matrix of lines and columns, and connected to line driver and column driver circuits respectively so as to be individually selectable in both line and column directions, and wherein display is made by selecting lines and columns successively, the improvement therein comprising:

a voltage controlled oscillator circuit, said oscillator circuit producing a shift clock signal applied to said column driver circuits for selecting individual columns in succession;

first frequency divider means for dividing down an output frequency signal from said oscillator circuit, the output of said first frequency divider means being a clock signal applied to said line driver circuits for selecting individual lines in succession;

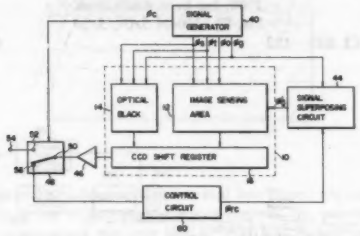
phase comparison means, said comparison means determining the difference in phase of a output of said first frequency divider means with the phase of a horizontal synchronizing signal, said horizontal synchronizing signal being a portion of a television signal transmission, an output of said comparison means being fed back to said oscillator circuit, said feedback being in proportion to said phase difference, said oscillator circuit being adapted to adjust the output frequency of oscillation in response to said phase difference signal, said adjustment causing said phase difference to approach zero, said clock signals being synchronized with said horizontal synchronizing signal;

a synchronizing signal separator circuit, said television signal transmission including a composite synchronization signal, said separator circuit separating a vertical synchronizing signal from said composite signal, and a signal including said horizontal synchronizing signal, said synchronizing signal separator circuit including an inverter, first capacitor, first resistor and a MOS FET, said MOS FET having gate and drain electrodes connected together, the source and drain of said MOS FET being connected across said inverter, said first capacitor being connected at one end in series with said inverter and charging through said MOS FET, said signal transmission being input to the other end of said capacitor, said first capacitor discharging through said first resistor.

4,492,980
SOLID STATE IMAGE-SENSING DEVICE

Nozomu Harada, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 31, 1981, Ser. No. 297,968
Claims priority, application Japan, Sep. 10, 1980, 55-124510
Int. Cl.³ H04N 3/14, 5/30
U.S. Cl. 358—213 13 Claims



1. A solid state image-sensing device which comprises:

(a) a group of matrix-arranged cells, each of which includes means for generating signal charges corresponding to the luminosity of an introduced light, means which forms a potential well and stores therein mixed charges consisting of the second charges produced by said signal charge-generating means and first unnecessary noise charges;

(b) detection means for detecting the amount of said noise charges stored in said charge-storing means and issuing a first electrical signal corresponding to the detected amount of said first noise charges;

(c) elimination means in response to said first electrical signal for eliminating said first noise charges detected by said detection means from the mixed charges stored in said charge-storing means;

(d) readout means connected at least to said matrix-arranged cell group for reading out the amount of the remaining portion of the mixed charges after removal of the first charge which equals said second charges; and

(e) each of said cells further including transfer means for transferring the remaining portion of the mixed charges stored in said potential well of said charge-storing means and gate means which is disposed between said charge-storing means and transfer means to form a second potential well and freely move the remaining portion of the mixed charged between said charge-storing means and transfer means by varying the depth of said second potential well.

4,492,981
TV CAMERA TUBE

Kazuhisa Taketoshi, and Chihaya Ogusu, both of Tokyo, Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed Jan. 11, 1982, Ser. No. 338,239
Claims priority, application Japan, Jan. 29, 1981, 56-10848; Jan. 29, 1981, 56-10850
Int. Cl.³ H04N 9/04; H01J 29/45
U.S. Cl. 358—217 22 Claims

1. A TV camera tube having an envelope containing a glass faceplate and an electron gun including a cathode, comprising:

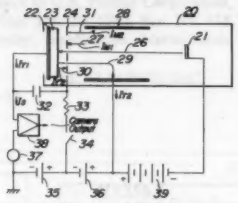
an n-type transparent electrode layer formed on said glass faceplate;

a photoconductive target composed at least of a photoconductive layer formed by depositing a thin p^+-type layer, a p-type layer and an n-type layer in succession on said n-type transparent electrode layer, and

a block layer formed on said photoconductive layer for blocking an electron beam emitted from said cathode passing through said photoconductive layer;

a metal mesh disposed in the vicinity of a side of said photoconductive target, said side being scanned by said electron beam; and

a collector electrode disposed between said metal mesh and

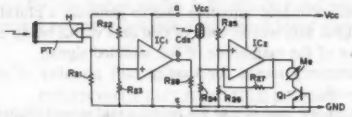


said cathode for collecting secondary electrons emitted from said photoconductive target, whereby said photoconductive target is scanned by said electron beam emitted from said cathode.

4,492,982
VIDEO CAMERA IMAGE TUBE BURN-IN PREVENTION APPARATUS

Hiroyuki Takimoto, Yokohama; Takashi Kuniyoshi, Sagamihara, and Tatsuzo Ushiro, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 251086, Apr. 6, 1981, abandoned. This application Nov. 10, 1983, Ser. No. 550,517
Claims priority, application Japan, Apr. 18, 1980, 55-51221; Apr. 18, 1980, 55-51222; Apr. 18, 1980, 55-51223
Int. Cl.³ H04N 5/193
U.S. Cl. 358—228 22 Claims



1. A video camera, comprising:

an imaging pick up tube for picking up object images, including a light receiving face plate and a heater;

detecting means for detecting an initially operative condition of said imaging tube;

interrupting means for interrupting an incident light irradiating to said light receiving face plate;

power supply means for supplying power to said heater; and

control means associated with said power supply means for causing said interrupting means to operate when the application of power by said power supply means is interrupted, and for releasing the operation of said interrupting means in response to detecting output from said detecting means after the application of power by said power supply means.

4,492,983
SYSTEM FOR DECODING COMPRESSED DATA

Shigeru Yoshida, Kawasaki; Minoru Koseki, Koshigaya, and Masakatsu Horie, Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP80/00185, § 371 Date Apr. 17, 1981, § 102(e) Date Apr. 17, 1981, PCT Pub. No. WO81/00659, PCT Pub. Date Mar. 5, 1981
PCT Filed Aug. 15, 1980, Ser. No. 253,924
Claims priority, application Japan, Aug. 17, 1979, 54-104635
Int. Cl.³ H04N 7/12
U.S. Cl. 358—260 3 Claims

1. A system for decoding compressed data, operatively

connectable to a length equalizing circuit to receive therefrom data for independent and correlated elements and relative distance data therefrom, comprising:

a memory for storing reference data for a reference element;

a first register, operatively connected to said memory, for storing and passing therethrough the reference data;

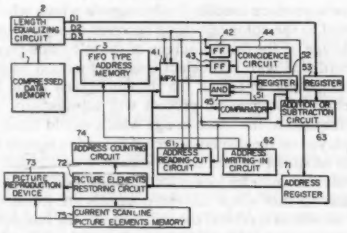
a second register, operatively connectable to the length equalizing circuit, for storing and passing therethrough the relative distance data;

an addition/subtraction circuit, operatively connected to said first and second registers, for generating an address of a needed element in dependence upon the reference element data and the relative distance data;

a third register, operatively connected to said addition/subtraction circuit and said memory, for storing and passing therethrough the address of the needed element;

a multiplexer, operatively connected to said memory, said first register and said third register, and operatively connectable to the length equalizing circuit, for multiplexing between said memory and said third register in dependence upon the data for the independent and correlated elements;

a comparator, operatively connected to said third register and said first register, for generating a greater than signal in dependence upon the reference data and the address of the needed element;



a coincidence circuit, operatively connectable to the length equalizing circuit to receive the data for the independent and correlated elements, for generating a coincidence signal;

an AND circuit, operatively connected to said coincidence circuit and said comparator, for generating an output signal in dependence upon the coincidence signal and the greater than signal;

an address reading-out circuit, operatively connected to said coincidence circuit, said AND circuit and said memory, and operatively connectable to the length equalizing circuit, for controlling the reading out of the data concerning color change elements from said memory in dependence upon the output signal and the data for the independent and correlated elements and for generating data for a preceding element, said coincidence signal being generated in dependence upon the data for the independent and correlated elements and the data for the preceding element; and

an address writing-in circuit, operatively connected to said memory and operatively connectable to the length equalizing circuit, for controlling the writing of data concerning color change elements into said memory in dependence upon the data for the independent element.

4,492,984

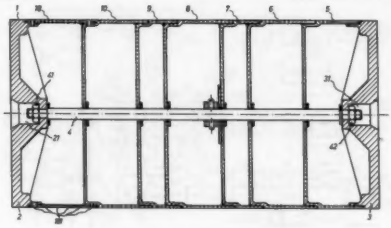
DRUM SCANNERS

Wolfgang Dinse, Altenholz; Ralf Balzeit, Preetz, and Reinhard Gesell, Schönkirchen, all of Fed. Rep. of Germany, assignors to Dr.-Ing. Rudolf Hell GmbH, Kiel, Fed. Rep. of Germany

Filed Nov. 1, 1982, Ser. No. 438,016

Int. Cl.³ H04N *1/06, 1/04*

U.S. Cl. 358—289 **17 Claims**



14. A drum scanner roller comprising a plurality of rings of the same external diameter, joined together to form a continuous outer surface, each ring having opposed end faces, said rings being assembled in end to end axially aligned relation with the end faces of adjacent rings abutting each other to form a joint, an annular coupling within at least one end of each ring at a joint, means connecting adjacent rings at each joint to the annular coupling, and a circular transverse plate within and connected to an annular coupling.

4,492,985

BEAM SCANNING MEANS FOR INPUT/OUTPUT UNIT

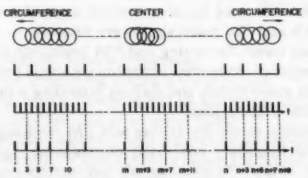
Masato Sato; Hiroyuki Kataoka, and Yoshio Arai, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1981, Ser. No. 291,738

Claims priority, application Japan, Aug. 19, 1980, 55-116383[U]

Int. Cl.³ H04N *1/10*

U.S. Cl. 358—293 **7 Claims**



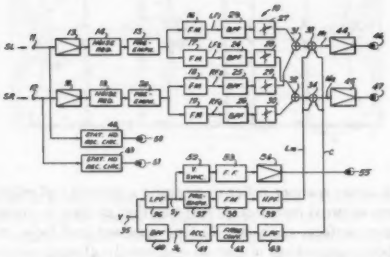
1. In an input and/or output unit for pictures which reads or records a picture with a scanning beam, the improvement comprising: a sampling signal generator for generating a sampling signal with a timing such that an interval of said scanning beam between sampling points on a scanning line is constant, said said interval being determined by a read-only memory storing numerial values corresponding to constant sampling point intervals on a scanned surface.

4,492,986

VTR WITH HIGH-QUALITY AUDIO RECORDING SYSTEM

Takashi Kono, Hachioujl; Akira Minegishi, Tokyo, and Toshimitsu Kamai, Higashikurume, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 8, 1982, Ser. No. 447,874
Claims priority, application Japan, Dec. 15, 1981, 56-201916
Int. Cl.³ H04N 9/491
U.S. Cl. 358—330 32 Claims



18. Apparatus for recording color video and audio signals comprising:

frequency-modulating means for modulating a plurality of carriers having different frequencies by an audio signal to be recorded and thereby providing a corresponding plurality of respective FM audio signals;

video signal processing means receiving a color video signal which has luminance and chrominance components and including additional frequency-modulating means for modulating an additional carrier with said luminance component, said additional carrier having a frequency substantially higher than that of each of the carriers of said FM audio signals so that the resulting FM luminance signal is in a band of which at least the major part is above a band containing said FM audio signals, and frequency converting means for converting said chrominance component to a frequency converted chrominance signal in a relatively low frequency band spaced from said band of said FM luminance signal to provide a gap therebetween in which said FM audio signals are situated;

first mixing means for mixing said FM luminance signal and said frequency converted chrominance signal with one of said FM audio signals and thereby providing a first mixed audio and video signal;

second mixing means for mixing said FM luminance signal and said frequency converted chrominance signal with another of said FM audio signals and thereby providing a second mixed audio and video signal;

first and second magnetic heads respectively receiving said first and second mixed audio and video signals from said first and second mixing means for recording said first and second mixed signals in respective record tracks on a magnetic record medium;

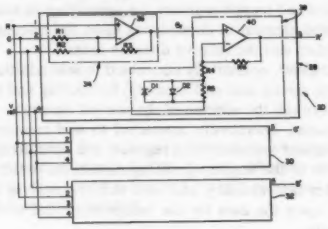
means for varying the levels of said FM audio signals in said first and second mixed audio and video signals upon changes in the level of said audio signal to be recorded.

4,492,987

PROCESSOR FOR ENHANCING VIDEO SIGNALS FOR PHOTOGRAPHIC REPRODUCTION

James L. Burkhardt, Watertown, and John J. McCann, Belmont, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 22, 1982, Ser. No. 360,468
Int. Cl.³ H04N 5/76
U.S. Cl. 358—332 17 Claims



1. A signal processor for use with a color television receiver of the type having a colored display screen, comprising:

circuit means for receiving color video signals from the color television receiver in order to impose a select transfer function to the received color video signals which function generally approximates the inverse of the transfer function of a selected photographic reproduction process so as to produce modified video signals which when transmitted to the color television receiver operate to produce an image on the display screen of the television receiver in accordance with said select transfer function such that a photographic image of the display screen made by said selected photographic process will substantially visually correspond to the video image which would otherwise be displayed on the display screen if the video signals had not been modified by said circuit means, wherein said circuit means also includes means for further modifying the video signals so that when the video signals are transmitted to the television receiver, the saturation of the imaged colors on the display screen is enhanced to at least partly compensate for a mismatch in the spectral emission properties of the display screen and the spectral sensitivities in the photosensitive layers of a photosensitive material selected for the photographic reproduction process; and

means for connecting said circuit means to receive said video signals from the receiver and to transmit said modified video signals back to the colored display source.

4,492,988

DROPOUT COMPENSATION SYSTEM

Kiyokazu Hashimoto, Matsubara, and Keizi Hayashi, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 25, 1982, Ser. No. 411,265
Claims priority, application Japan, Aug. 27, 1981, 56-134587
Int. Cl.³ H04N 5/76
U.S. Cl. 358—336 7 Claims

1. A dropout compensation system comprising:

input means for receiving a modulated signal subject to dropouts;

dropout detector means having an input connected to said input means, an output and a control output, for producing a first control signal in response to the occurrence of a dropout;

first switch means having an output, a first input connected to said input means, a second input, and a control input connected to the control output of said dropout detector means, said first switch means being controlled by said first control signal such that the modulated signal applied

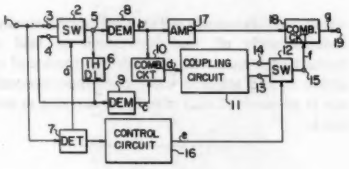
to said first input is normally introduced to the output thereof and when the dropout occurs, the signal of said second input is introduced to said output;

delay means having an input connected to the output of said first switch means and an output connected to the second input of said first switch means;

means for demodulating said modulated signal, said demodulating means including a first demodulator having an input connected to the output of said first switch means and an output and including a second demodulator having an input connected to the output of said delay means and an output;

first combining means having a first input connected to the output of said first demodulator, a second input connected to the output of said second demodulator and an output, for producing a difference signal between first and second input signals;

means having an input connected to the output of said dropout detector means, and an output, for producing second control signals of a predetermined time length respectively starting from the beginning and end of the dropout detection by said first control signal, or producing a second control signal having a maximum time length starting from the generation of said first control signal until a predetermined time elapses after the end of dropout detection;



second switch means having at least an input, an output and a control input supplied with the second control signal, for switching the passage and cutoff of the input signal applied to the input terminal thereof in response to the second control signal without substantially changing the DC voltage at the output thereof;

coupling means for coupling the output of said first combining means and the input terminal of said second switch means; and

second combining means having a first input connected to the output of said first demodulator, a second input connected to the output of said second switch means and an output, for combining signals applied to said first and second inputs and producing a dropout-compensated signal.

4,492,989

TIME BASE CORRECTING APPARATUS

Nobuhiko Watanabe, and Masato Tanaka, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 10, 1983, Ser. No. 465,462
Claims priority, application Japan, Feb. 15, 1982, 57-22290
Int. Cl.³ G11B *5/00*
U.S. Cl. 360—32 **5 Claims**

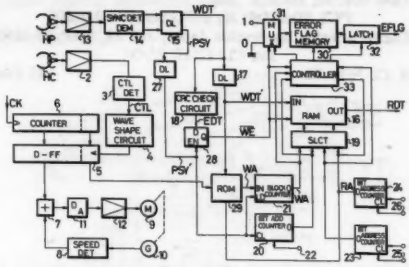
1. A time base correcting apparatus for correcting time base errors in a digital signal supplied thereto in the form of successive data blocks, each data block including at least plural data words and a block address circulating with a predetermined phase relation to a reference signal, said apparatus being characterized by:

memory means having plural addressable storage locations, each storing a respective data block;

write address generating means responsive to said block address for generating write-in addresses to identify particular storage locations into which the supplied data blocks are written;

write-in means for writing successive data blocks into those storage locations identified by said write address generating means;

read address generating means for generating read-our addresses to identify particular storage locations from which a stored data block is read out;



read-out means for reading out the contents of a storage location identified by said read address generating means; and

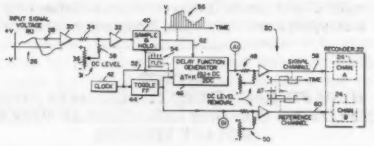
means contained in said write address generating means for varying said write-in address by a lock mode signal, said lock mode signal representing a phase relation at which said incoming digital signal is locked.

4,492,990

NOISE REDUCTION SYSTEM

Clark E. Johnson, Jr., Minneapolis, Minn., assignor to Vertimag Systems Corporation, Minneapolis, Minn.

Filed Feb. 28, 1983, Ser. No. 470,435
Int. Cl.³ G11B *5/00, 5/09*
U.S. Cl. 360—32 **19 Claims**



1. A recording system comprising:

means for generating a square-wave signal;

sampling means synchronized to said generating means for providing samples of an input signal;

delay means coupled to said generating means and driven by said samples of said sampling means for delaying, independently, the leading and the trailing edges of successive pulse of said square-wave signal to provide a delayed signal, the amount of delay in said delayed signal being dependent on amplitudes of said samples;

means for recording said square-wave signal and said delayed signal in synchronism with each other, said square-wave signal serving as a time-reference signal during playback; and

playback means coupled to said recording means for retrieving said input signal.

4,492,991

METHOD AND APPARATUS FOR CONTROLLING THE STEPPING FEED OF AN INFORMATION MEDIUM

Noboru Osada, Yokohama; Akira Kanamori, Kanazawa; Takashi Kimura, Kawasaki; Seiro Moroto, Tokyo; Hideo Horie, and Teruhide Yoshinoe, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

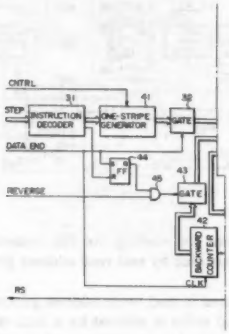
PCT No. PCT/JP81/00172, § 371 Date Mar. 22, 1982, § 102(e) Date Mar. 22, 1982, PCT Pub. No. WO82/00540, PCT Pub. Date Feb. 18, 1982

PCT Filed Jul. 30, 1981, Ser. No. 364,850

Claims priority, application Japan, Jul. 31, 1980, 55-105896

Int. Cl.³ G11B *21/04*

U.S. Cl. 360—70 **12 Claims**



1. A method for controlling the stepping feed of a tape-shaped information medium on which recording tracks are formed by stripes, the recording tracks running diagonally or perpendicularly across the information medium, said method comprising the steps of:

(a) accessing data on a first recording track by performing an action selected from among recording the data and reading the data;

(b) checking the accessed data on the first recording track;

(c) feeding the information medium to access data on a second recording track next to the first recording track, said feeding starting after said accessing step (a) is completed and before said checking step (b) is completed; and

(d) determining whether the feeding of said feeding step (c) is to be continued or reversed in dependence upon the result of said checking step (b) when said checking step (b) is completed and before said feeding step (c) is completed.

4,492,992

HIGH STORAGE DENSITY DISC DATA STORE EMPLOYING CONTROLLED-ANGULAR-VELOCITY ROTARY MEDIUM

John O. Rooney, 29, Drum Close, Stenton, Glenrothes, Fife, Scotland, and Ian B. Freeman, 2242, Ptarmigan Ct., Union City, Calif. 98457

Continuation-in-part of Ser. No. 138,469, Apr. 8, 1980, abandoned. This application Jun. 24, 1982, Ser. No. 391,804

Claims priority, application United Kingdom, Apr. 17, 1979, 7913220

Int. Cl.³ G11B *5/55, 19/24*

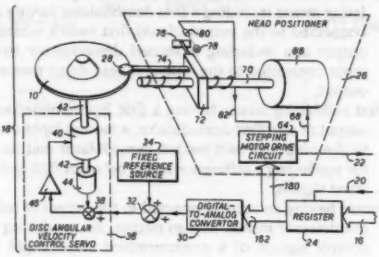
U.S. Cl. 360—73 **22 Claims**

1. A store for the storage of retrievable informational data in a plurality of concentric, circular storage tracks on a rotary medium, said store comprising:

a positioner coupled to receive (a) track address information indicative of a selectable one, or a group, of said plurality of tracks and operable to respond thereto to move a data recording or recovering transducer toward adjacence with said selected track, or group of tracks, and

an angular velocity controller coupled to receive said track address information and operable to respond thereto to select a related value of angular velocity for said medium associated with said track, or track group, and to (move) adjust said angular velocity toward said selected value,

whereby said angular velocity controller is operable to (move) adjust said angular velocity toward said selected



value (simultaneously with) contemporaneously with, but independently of, said movement of said transducer toward adjacence with said selected track and operable to arrive at said selected value contemporaneously with, if not in advance of, said transducer arriving at said selected track.

4,492,993

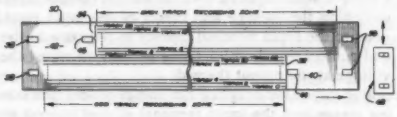
MAGNETIC RECORDING TAPE AND CORRESPONDING METHOD PROVIDING INDICATION OF END-OF-TAPE CONDITIONS

Douglas A. Otis, North Hollywood, Calif., assignor to Rostream Research Associates, Ltd., Cerritos, Calif.

Filed Dec. 14, 1982, Ser. No. 449,599

Int. Cl.³ G11B *15/06, 15/22, 23/30, 23/42*

U.S. Cl. 360—74.5 **8 Claims**



1. A method of detecting a warning marker indicative of an approaching end-of-tape condition for one direction of tape motion, and indicative of a load point in the other direction of tape motion, said method comprising the steps of:

positioning a first set of the recording tracks on a first half of the tape, for reading and writing in a first tape direction;

positioning a second set, constituting the remainder of the recording tracks, on the second half of the tape, for reading and writing in the opposite tape direction, the second set of tracks being offset longitudinally with respect to the first set, leaving a first unrecordable half-width region prior to the beginning of the first set of tracks and a second unrecordable half-width region prior to the beginning of the second set of tracks;

providing a first tape marker located in the first unrecordable region in such a position as to be encountered when the beginning of one of the first set of tracks is positioned in engagement with a read/write head, and also serving as a warning marker when one of the second set of tracks is being used; and

providing a second tape marker located in the second unrecordable region in such a position as to be encountered when the beginning of one of the second set of tracks is positioned in engagement with the read/write head, and

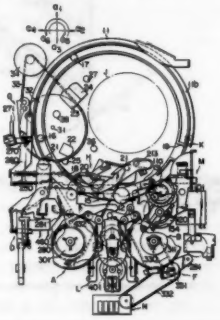
also serving as a warning marker when one of the first set of tracks is being used.

4,492,994

VIDEO TAPE RECORDER

Kenichi Suda, Kawasaki; Katsuyuki Tamaki, Yokohama; Kazushi Tateishi, Kawasaki, and Kohichiroh Abe, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha and Teac Corp., both of, Japan

Filed Feb. 12, 1982, Ser. No. 348,177
Claims priority, application Japan, Feb. 16, 1981, 56-21029
Int. Cl.[3] G11B *5/08, 5/008, 15/00, 17/00*
U.S. Cl. 360—85 7 Claims



1. In a video tape recorder comprising a motor; a loading disc; a supply reel mount and a take-up reel mount; and a reel mount driving device to be selectively associated with the supply reel mount and the take-up reel mount to establish recording, playback, rewinding, fast-forward, and stop modes, the improvement which comprises:

mode switching means for selectively transmitting the rotary force of the motor to the loading disc and the reel mount driving device so that the loading disc is rotated when the rotary force is transmitted to the loading disc, and to set the reel mount driving device to a selected one of said modes when the rotary force is transmitted to the reel mount driving device, wherein said mode switching means includes:

(a) clutch means for selectively transmitting the rotary force of the motor to the loading disc and the reel mount driving device,

(b) a loading gear engaging the loading disc,

(c) a cam arm coupled with the reel mount driving device, and

(d) a mode cam means capable or rotation for moving the cam arm according to the rotation angle position of the mode to set the reel mount driving device to the selected mode by means of the cam arm, the loading gear and the mode cam means being connected with the motor by the clutch means, wherein

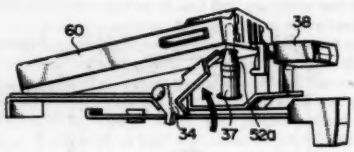
said clutch means transfers the rotary force from said loading disc to said reel mount driving device in response to said clutch means sensing an increased load transmitted thereto by said loading disc, said increased load indicative that said loading disc has stopped rotating, whereby said clutch means causes said reel mount driving device to thereupon rotate so as to set said reel mount driving device at said selected mode by virtue of said transferred rotary force.

4,492,995

TAPE CASSETTE LOADING AND EJECTION DEVICE

Seiji Tomita, Yokosuka, and Hideo Yokoyama, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 322,911, Nov. 19, 1981, abandoned, which is a continuation-in-part of Ser. No. 162,446, Jun. 24, 1980, Pat. No. 4,360,174. This application Apr. 18, 1984, Ser. No. 601,120
Claims priority, application Japan, Jun. 29, 1979, 54-89362
Int. Cl.[3] G11B *15/66*
U.S. Cl. 360—96.5 7 Claims



1. A tape cassette loading device for selectively holding, in an operating position or an ejection position, a tape cassette of the type including forward and rearward portions and having at least one guide hole which includes a bottom edge defined in said forward portion, said tape cassette loading device comprising:

chassis means defining one surface on which the tape cassette is mounted when in said operating position;

guide pin means protruding from said one surface of said chassis means and engageable with said at least one guide hole to guide the tape cassette throughout the entire movement thereof between said operating and ejection positions; and

ejection means operatively associated with said chassis and moveable along said guide pin between an upper position and a lower position to responsively displace the tape cassette between said operating position and said ejection position, respectively, said ejection means operating to raise said forward portion of the tape cassette so as to angularly dispose the tape cassette when in said ejection position relative to said one surface; and wherein

said guide pin means includes downwardly and outwardly tapered surface defined at a predetermined height above said surface, said tapered surface establishing means for retaining said bottom edge of said guide hole in bearing contact against said tapered surface to responsively retain the tape cassette in said angularly disposed ejection position while yet permitting the tape cassette to be manually moved to said operating position upon application of pressing force to the tape cassette to cause said bottom edge to slide along said tapered surface.

4,492,996

ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Takashi Saito, Ayase, Japan, assignor to Victor Company of Japan, Ltd., Kanagawa, Japan

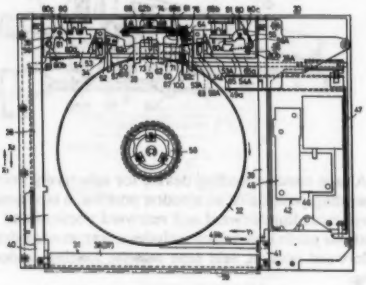
Filed Jun. 7, 1982, Ser. No. 386,138
Claims priority, application Japan, Jun. 12, 1981, 56-90322
Int. Cl.[3] G11B *5/016;* B65D *85/30;* G11B *23/02;* G03B *17/26*
U.S. Cl. 360—99 6 Claims

1. A rotary recording medium reproducing apparatus for reproducing a rotary recording medium accommodated within a case, said case comprising a jacket provided with a space for accommodating said rotary recording medium and an opening for allowing said rotary recording medium to go in and out of said jacket, and a lid member inserted through said opening of said jacket for closing said opening of said jacket, said rotary recording medium reproducing apparatus comprising:

lid member locking and holding means provided at an inner-

most part of said reproducing apparatus, for locking and leaving said lid member inside said reproducing apparatus when said case is inserted into said reproducing apparatus through an inserting opening provided thereat, and for releasing the lock with respect to said lid member when an empty jacket is inserted into said reproducing apparatus;

lid member connection releasing means for releasing connection of said lid member with respect to said jacket when said case is inserted into and then pulled out from said reproducing apparatus, and for connecting said lid member to said empty jacket when said jacket is inserted into and then pulled out from said reproducing apparatus;



lid member push-back means for pushing back said lid member released from locking in a direction approaching said empty jacket which is inserted, interrelatedly with the lock releasing operation of said lid member locking and holding means; and

jacket pull-out preventing means provided interrelatedly with said lid member push-back means, for permitting said jacket to be pulled out when said lid member is pushed back to connect with said jacket, and preventing said jacket from being pulled out in a state where said lid member is not connected to said jacket.

4,492,997

REPRODUCING AND AMPLIFYING CIRCUIT FOR MAGNETORESISTIVE HEAD

Takao Arai, and Takaharu Noguchi, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

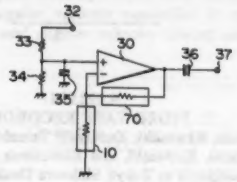
Filed Nov. 24, 1981, Ser. No. 324,674

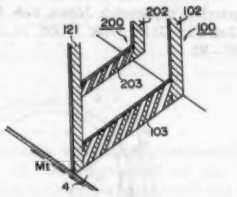
Claims priority, application Japan, Nov. 28, 1980, 55-166551; Dec. 10, 1980, 55-173261

Int. Cl.³ G11B *5/00*

U.S. Cl. 360—113 **12 Claims**

1. A reproducing and amplifying circuit for a magnetoresistive head engageable with a magnetic recording medium for reproducing an electric signal from magnetization in said recording medium, comprising circuit means for amplifying said reproduced electric signal derived from said head, said amplifying circuit means including an amplifier circuit and a feedback circuit for said amplifier circuit, in which said feedback circuit is provided with means for electrical connection with said head so that said head constitutes a part of said feedback circuit thereby for supplying a drive current to said head and coupling said reproduced electric signal to said amplifying circuit means for its amplification, and said amplifying circuit means has such a circuit structure that in operation the voltage at the junction of said head and said feedback circuit is held constant in which said amplifier circuit includes a differential amplifier having a non-inverted input terminal for receiving a fixed potential and an inverted input terminal for electrical





connection with said head by said electrical connection means in said feedback circuit.

4,492,998

CASSETTE TAPE RECORDER

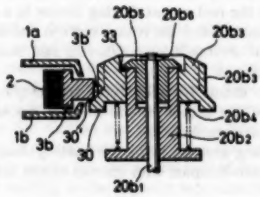
Tesuro Kamimura, and Seiichiro Matsuki, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 7, 1982, Ser. No. 415,620

Claims priority, application Japan, Sep. 7, 1981, 56-131920[U]

Int. Cl.³ G11B *23/02*

U.S. Cl. 360—132 **15 Claims**

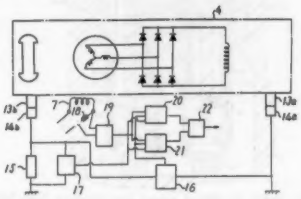


1. A cassette tape recorder of the type comprising at least one rotatable shaft unit for extending through an aperture in a cassette reel, said cassette reel having reel projections extending toward said shaft unit from the periphery of said aperture, said rotatable shaft unit having shaft unit projections thereon for matingly engaging said reel projections, with said shaft being adapted to be rotated by said cassette reel when said cassette reel rotates in a tape suppy direction, said shaft unit further including a tapered portion adjacent said reel having a sloping surface coaxial with a center axis of said shaft unit for supporting said cassette reel at a position coaxial with said center axis along said sloping surface, thus insuring positive centering of said cassette reel and minimizing wow.

4,492,999
SUPERVISORY UNIT FOR ROTARY ELECTRICAL MACHINERY AND APPARATUS

Nobutada Amagasa, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00161, § 371 Date Dec. 15, 1982, § 102(e) Date Dec. 15, 1982, PCT Pub. No. WO82/04164, PCT Pub. Date Nov. 25, 1982
PCT Filed May 10, 1982, Ser. No. 456,013
Claims priority, application Japan, May 9, 1981, 56-71813; May 9, 1981, 56-71814; May 9, 1981, 56-71815
Int. Cl.³ H02H 7/06
U.S. Cl. 361—21 4 Claims

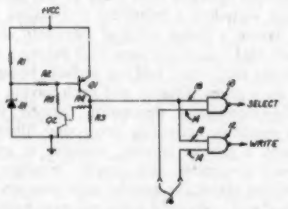


1. In rotary electrical machinery and apparatus of rotary field system type comprising a first detection earthing brush disposed on an end of a rotor shaft, and a second detection earthing brush disposed on the other end of said rotor shaft through a resistance circuit, and said rotary electrical machinery and apparatus receiving power source supply from a thyristor exciter through a slip ring, a supervisory unit for said rotary electrical machinery and apparatus characterized by comprising a first detector for detecting voltage across both ends of said resistance circuit; a second detector for detecting voltage across said both earthing brushes; a third detector for detecting electrical signals of an AC exciter which constitutes a part of the field system side of said rotary electrical machinery and apparatus; and an abnormality detecting means wherein the values of shaft voltage and frequency are detected on the basis of signals of said respective detectors, and comparison is made to determine if said voltage and frequency values are greater than a reference value, and wherein if said values are greater than said reference value, said means provides a signal indicating an abnormal condition.

4,493,000
POWER ON/OFF PROTECT CIRCUIT

Michael W. Edwards, Oklahoma City, Okla., assignor to Magnetic Peripherals Incorporated, Minneapolis, Minn.

Filed Sep. 30, 1983, Ser. No. 537,907
Int. Cl.³ H02H 3/24
U.S. Cl. 361—92 2 Claims



1. Power on/off protect circuit for enabling one or more logic gates when their power supply voltage is above a predetermined level at which the outputs of the logic gates are indeterminate and for disabling the gates before the voltage drops below said predetermined level, comprising:

one or more gates having outputs which are indeterminate when the gates power supply is below a first predetermined voltage level and whose output is off when at least one input is held below a second predetermined voltage above ground;

a set of inputs to said one or more gates connected through a low impedance resistor to ground;

a first transistor whose collector is connected to said set of inputs between said low impedance resistor and said gates;

a power supply whose voltage level is to be monitored connected to the emitter of said first transistor and to the base of said first transistor through one or more resistors;

a zener diode connected on one side to ground and on the other side to the base of said first transistor and to the the power supply between said power supply and one or more resistors; the zener diode adapted to conduct above a third predetermined voltage level, said predetermined third voltage level being at least a predetermined voltage drop level above a level sufficient to reliably operate logic gates;

a second transistor;

the base of said second transistor connected through a resistor to the collector of said first transistor;

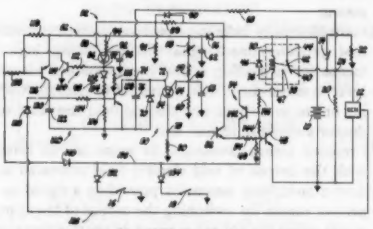
the emitter of said second transistor connected to ground; and

the collector of said second transistor connected to the base of said first transistor; whereby the second transistor operates to maintain the first transistor in a conducting state for said predetermined voltage drop after the zener diode has ceased to conduct in response to said power supply voltage dropping below said third predetermined voltage, after which said first transistor ceases to conduct and the voltage input to said logic gates falls below said second predetermined voltage level thereby disabling said logic gates.

4,493,001
MOTOR VEHICLE BATTERY RUNDOWN PROTECTION SYSTEM

Leonard J. Sheldrake, Noblesville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1983, Ser. No. 550,365
Int. Cl.³ H02H 7/18
U.S. Cl. 361—92 3 Claims



1. In a motor vehicle electrical system including an electrical load and a battery for supplying power to such load when the vehicle engine is not running, apparatus comprising:

a switching mechanism trippable to interrupt the supply of power from said battery to said electrical load;

means defining a reference battery voltage determined in relation to the nominal current drain of said electrical load such that if the actual battery voltage falls significantly below such reference voltage, the energy remaining in the battery may be insufficient to restart the vehicle engine;

protective means responsive to the actual battery voltage and operative following a time delay which is initiated when the actual battery voltage falls below said reference

battery voltage for tripping said switching mechanism thereby to interrupt the supply of power to said load before the battery is too discharged to restart the vehicle engine; and

override means responsive to an abrupt drop in the actual battery voltage indicative of vehicle entry for inhibiting the operation of said protective means for a timed period sufficiently long in duration to enable entry of the vehicle and starting of the engine so that battery voltage drops incident to entry of the vehicle do not result in interruption of the supply of power to the electrical load.

4,493,002

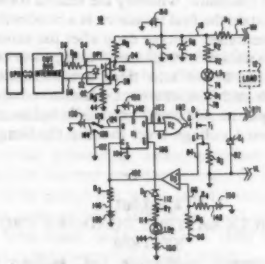
ELECTRONIC CIRCUIT BREAKER

Kenneth R. Pelowski, Bloomfield Township, Oakland County, and Robert J. Winkel, Royal Oak, both of Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 28, 1983, Ser. No. 470,651

Int. Cl.³ H02H 3/08

U.S. Cl. 361—93 **1 Claim**



1. Solid state electronic circuit breaker apparatus comprising:

(a) an electric field activated semiconductor switching means;

(b) an electrically isolating optocoupler for responding to a first predetermined signal for activating logic circuit means for providing a first predetermined electric field level to said electric field activated semiconductor switching means to activate said electric field activated semiconductor switching means; and

(c) resistor means connected in series circuit relationship with the output of said electric field activated semiconductor switching means for providing a signal to a comparator means for switching the output of the comparator means when the voltage across said resistor means exceeds a predetermined value as a function of load current flowing therethrough the output of said comparator means is connected to the input of a flipflop means for causing said flipflop means to change state to in turn energize a NOR logic means to change state. The output of said NOR logic means being interconnected with said electric field activated semiconductor switching means and the input of said NOR logic means being connected to said optocoupler means and said flipflop means for overriding said optocoupler means for causing said electric field activated semiconductor switching means to become nonconductive when load current as measured across said resistor means exceeds a predetermined value.

4,493,003

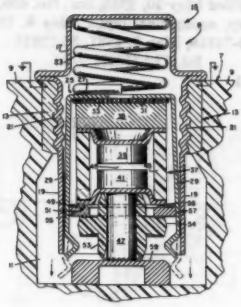
SURGE ARRESTER ASSEMBLY

Nils P. Mickelson, Raymond, Me., and Richard P. De LaChapelle, Rockport, Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 28, 1983, Ser. No. 461,764

Int. Cl.³ H02H 9/06

U.S. Cl. 361—119 **9 Claims**



1. A surge voltage arrester assembly comprising:

an electrically conductive tubular housing member;

an electrically conductive cage member disposed within and having resilient finger members slideably engaging said housing member;

a sealed cold cathode gas tube with first and second electrodes spaced by an insulator means to form a primary arc gap and said first electrode contacting said cage member;

an electrically conductive cylinder extending outwardly of said second electrode;

an insulator member and an electrical conductor telescoped over said cylinder to form a secondary arc gap intermediate said electrical conductor and second electrode; and

retainer means telescoped over said cylinder intermediate thereto and said electrical conductor and contacting said second electrode and said electrical conductor to exert a retaining force against said electrical conductor and insulator member.

4,493,004

SURGE ARRESTER WITH A GAS-FILLED HOUSING

Gerhard Lange, and Jürgen Boy, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,709

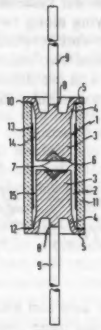
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1982, 3207663

Int. Cl.³ H02H 9/06

U.S. Cl. 361—120 **3 Claims**

1. Surge arrester, comprising a gas-filled housing, copper electrodes disposed opposite each other in said housing, said electrodes each including a relatively thin-walled truncated conical part having a flange integral therewith and a solid cylindrical part, said cylindrical parts each having a respective end surface facing each other, said end surfaces being mutually spaced apart by a given distance and each having a trough-shaped axially-symmetrical depression formed therein, a highly active electrode activating compound filling each of said depressions, a tubular ceramic insulator at least partly surrounding said electrodes, said ceramic insulator and said electrodes defining respective annular gaps between said insulator and each of said cylindrical parts, said gaps having widths being substantially between 0.2 mm and 0.4 mm, said gaps including rear spaces being low in vapor deposition, said insulator having end surfaces being vacuum-tightly hard soldered to said flanges, and at least one ignition line being disposed on

said insulator and respectively projecting into each of said gaps and into said rear spaces, said ignition lines projecting into each of said gaps by at least 1.5 mm measured from said end faces of said cylindrical parts, said given distance between said end



surfaces of said cylindrical parts being at most 3.5 times the width of one of said gaps, as said widths of said gaps are measured in vicinity of said at least one ignition line, said electrodes defining a discharge space including said gaps having a volume of at least 20 mm^3.

4,493,005

OVERLOAD BY-PASS CONDUCTOR WITH AN EXTERNAL SHORT CIRCUIT PATH

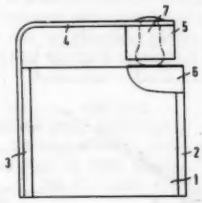
Gerhard Lange, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 24, 1982, Ser. No. 444,089

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1981, 3146787

Int. Cl.³ H02H 9/06

U.S. Cl. 361—124 **8 Claims**



1. Overload by-pass conductor with an external short circuit heat conduction path, comprising a metal carrier, a solder piece and other parts of the overload by-pass conductor, said other parts including an outer wall of the overload by-pass conductor, two electrodes disposed on said outer wall, one of said electrodes being a counter electrode, and a contact surface connected to said counter electrode, said metal carrier being disposed along said outer wall and being electrically conductingly connected to one of said electrodes, said solder piece being in a mechanically fixed connection with said metal carrier and being adjacent said contact surface, said solder piece being spaced from all of said other parts of the overload by-pass conductor in an operating state, and said solder piece being deformable for causing an external short circuit by directly contacting said contact surface upon the occurence of an overload, said external short circuit being triggered after a delay with respect to the beginning of the overload due to the heat conduction path.

4,493,006

GAS DISCHARGE OVERVOLTAGE ARRESTER WITH PARALLEL-CONNECTED SPARK GAP

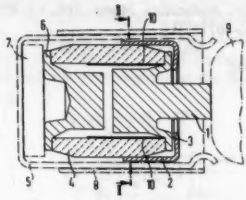
Gerhard Lange; Jürgen Boy; Ernst-Ludwig Hoene, and Oskar Sippekamp, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 332,654, Dec. 21, 1981, abandoned. This application Feb. 17, 1984, Ser. No. 580,759

Claims priority, application Fed. Rep. of Germany, May 7, 1981, 3118137

Int. Cl.³ H02H 9/06

U.S. Cl. 361—124 **9 Claims**



1. Overvoltage arrester having a gas-filled housing, comprising two overvoltage arrester electrodes disposed across from each other in the housing, a tubular insulator body spacing said overvoltage arrester electrodes apart from each other so as to define an isolating gap therebetween, a ring-shaped flange integral with one of said overvoltage arrester electrodes and forming a first spark gap electrode, a ring-shaped metal cap having an annular, radially inward projecting flange, said inward projecting flange surrounding and spaced from said first spark gap electrode and pressed onto said tubular insulator body, and a contact spring connecting said metal cap to the other of said overvoltage arrester electrodes, said metal cap inward projecting flange forming a second spark gap electrode defining with said first spark gap electrode a spark gap having a defined clearance therebetween smaller than the clearance of said isolating gap, said cap being inwardly arched in the vicinity of said spark gap.

4,493,007

NOISE ELIMINATOR

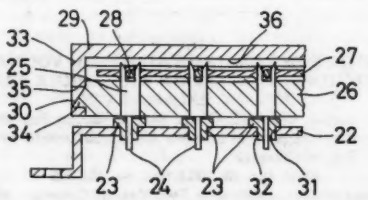
Masami Sugitani, Imadate, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Sep. 29, 1983, Ser. No. 537,043

Claims priority, application Japan, Oct. 1, 1982, 57-149866[U]

Int. Cl.³ H01G 1/14; H01R 13/38

U.S. Cl. 361—307 **5 Claims**



1. A noise eliminator characterized by comprising a substrate provided with feedthrough capacitors, feedthrough terminals inserted into said feedthrough capacitors respectively, insulation displacement connection portion which have sharp furcate portions and are provided at the upper ends of

said feedthrough terminals respectively, an insulating member holding said insulation displacement connection portion spaced at intervals coincident with those between said feedthrough capacitors disposed, and a cover insulator for press-fitting the furcate portions at said insulation displacement connection portion into a flat cable, so that said cover insulator is adapted to be fixed to said insulating member by holding means.

4,493,008

GAS-INSULATED SWITCHGEAR

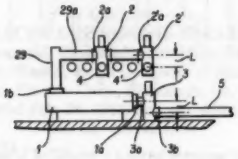
Eiichi Haginomori, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 12, 1982, Ser. No. 348,273

Claims priority, application Japan, Feb. 12, 1981, 56-19492; Jul. 22, 1981, 56-107717[U]

Int. Cl.³ H02B 1/04

U.S. Cl. 361—341 **3 Claims**



1. A gas-insulated switch-gear comprising:

a circuit breaker mounted parallel with respect to a horizontal ground plane and defining an axial line and having two ends;

a first line disconnecting switch mounted vertically with respect to said ground plane and having upper and lower terminal sections in which the upper terminal section thereof is connected to one end of said circuit breaker;

a line link bus defining an axial line and coupled to the lower terminal section of said first disconnecting switch;

a second vertical type line disconnecting switch having upper and lower terminal sections;

a bus link bus coupling said second disconnecting switch to the other terminal of said circuit breaker, said bus link having a horizontal portion defining an axial line and connected to the upper terminal section of said second disconnecting switch and a vertical portion connected to the other terminal section of said circuit breaker;

a horizontally disposed main bus located above said circuit breaker and defining a respective axial line, said main bus connected to the lower terminal section of said second disconnecting switch; and

the axial lines of said circuit breaker and said line linked bus defining a difference in height and the axial lines of said bus link bus and said main bus defining a difference in height which is equal to the difference in height between the axial lines of said circuit breaker and said line link bus.

4,493,009

COMPRESSED GAS INSULATED HIGH VOLTAGE SWITCHING INSTALLATION WITH SINGLE PHASE METALLIC ENCAPSULATION

Dieter Lorenz, and Willi Olsen, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 488,275

Claims priority, application Fed. Rep. of Germany, May 4, 1982, 3217186

Int. Cl.³ H02B 1/04

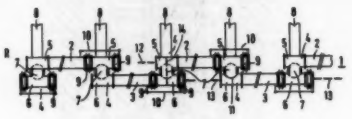
U.S. Cl. 361—341 **11 Claims**

1. In a compressed gas insulted high voltage switching installation with a metallic encapsulation, including bus bar systems and switchgear sections at least one of which is firmly anchored in space and in which compensators with tie rods are arranged in line with the bus bar systems, the improvement comprising:

(a) all branches of the switchgear sections in the installation firmly anchored in space;

(b) each phase of the bus bar systems being subdivided into sections alternately lying along two parallel longitudinal axes in such a manner that between three respective successive branches at least two successive sections having different longitudinal axis are disposed;

(c) double T-shaped connecting housings, having parts



aligned with said two axes and a cross piece connecting said parts with inner and outer connecting flanges at the ends of the parts aligned with said axes, disposed between and coupled to adjacent sections of the same phase, said double T-shaped housings firmly anchore in space;

(d) a compensator for each section of the bus bar, arranged at the ends said inner and outer connecting flanges at one of the two connecting housings disposed at opposite ends of said section; and

(e) tie rods extending from the outer flange of each compensator to its inner flange bridging said compensators and said connecting housing part.

4,493,010

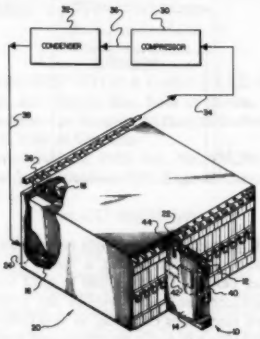
ELECTRONIC PACKAGING MODULE UTILIZING PHASE-CHANGE CONDUCTIVE COOLING

Robert A. Morrison, Granada Hills, and Attila Frink, Northridge, both of Calif., assignors to Lockheed Corporation, Burbank, Calif.

Filed Nov. 5, 1982, Ser. No. 439,482

Int. Cl.³ H05K 7/20

U.S. Cl. 361—385 **12 Claims**



1. An electronics packaging assembly comprising in combination:

a plurality of circuit board modules each comprising;

a housing having a chamber therein;

an inlet refrigerant fitting coupling the exterior of said module to said chamber, said inlet fitting having an inlet line extending into said chamber;

an outlet refrigerant fitting coupling the exterior of said housing to said chamber, said outlet fitting having an outlet line extending into said chamber;

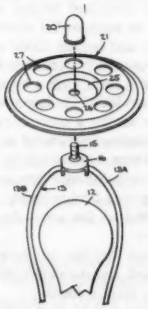
a plurality of electronic components within said chamber;
electrical termination means external to said module for making electrical connection to said electronic components inside said chamber;
an evaporator within said chamber, said evaporator being connected to said inlet line and said outlet line within said chamber;
an inert coolant liquid contained inside said chamber in surface contact with said electronic components and with said evaporator so as to facilitate the transfer of heat therebetween; and
means for retaining said liquid inside said chamber;
whereby when a compressed refrigerant liquid is introduced into said module via said inlet fitting, it may experience a change of phase within said evaporator and thereby absorb heat from said evaporator and the surrounding portion of said coolant liquid in surface contact therewith so as to maintain said coolant at a first temperature within a predetermined first temperature range which in turn will result in said electronic components being maintained within a predetermined second temperature range related to said first temperature by a predetermined differential temperature range;
a refrigeration compressor;
a refrigeration condensor;
a rack for holding said modules;
a plurality of inlet couplings attached to said rack;
a plurality of outlet couplings attached to said rack;
a plurality of external refrigerant lines respectively connecting said outlet couplings to said compressor, said compressor to said condensor, and said condensor to said inlet couplings;
a plurality of electrical connectors secured to said rack, at least one of said connectors being provided for each of said modules; and
means for removing a particular one of said modules from a first position wherein said inlet fitting of said particular module is in gas-tight connection with a corresponding one of said inlet couplings, said outlet fitting of said particular module is in gas-tight connection with a corresponding one of said outlet couplings, and said electrical termination means of said particular module is in electrical connection with a corresponding one of said electrical connectors to a second position wherein there is no fluid connection between said module and said external refrigerant lines and no electrical connection between said module and said electrical connectors.

4,493,011

AROMA DISC FOR TABLE LAMP

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Mar. 14, 1984, Ser. No. 589,465
Int. Cl.³ A61L 9/02
U.S. Cl. 362—96 **6 Claims**



1. An aroma disc usable in conjunction with a conventional table lamp whose light bulb socket has a harp secured thereto to support a lampshade having a spider provided with a center collar, the harp being provided with an upright bolt to receive the collar, said disc comprising:

A. a round pad of porous material having good wicking properties and impregnated with a liquid fragrance; and

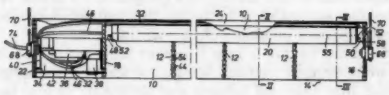
B. a pair of round plies on opposite faces of the pad, the plies being joined peripherally to form a disc having a peripheral seal which also rigidifies the disc, said disc having a center hole to accommodate said bolt, said plies having a circular array of openings therein concentric with the center hole to define ports for directly exposing the pad in the port regions thereof, whereby when the lamp is turned on, the resultant hot air currents penetrate the ports to volatilize the liquid fragrance to generate an aromatic vapor, the portions of the pad surrounding the port regions acting as a reservoir for the liquid fragrance which is wicked into the port regions as the liquid fragrance is volatilized.

4,493,012

COMBINED FIXTURE AND SHADE FOR TUBULAR FLUORESCENT LAMPS

Jann Petersen, 34, Rytterbakken, DK-2670 Greve Strand, Denmark

PCT No. PCT/DK81/00113, § 371 Date Aug. 10, 1982, § 102(e) Date Aug. 10, 1982, PCT Pub. No. WO82/02081, PCT Pub. Date Jun. 24, 1982
PCT Filed Dec. 10, 1981, Ser. No. 414,322
Claims priority, application Denmark, Dec. 11, 1980, 5277/80
Int. Cl.³ F21S 3/00
U.S. Cl. 362—225 **15 Claims**



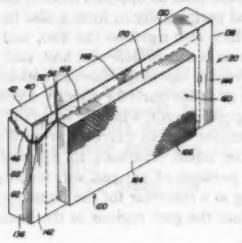
1. A combined elongated light fixture and shade structure for at least one fluorescent tube,
comprising, in combination,
an elongated first housing adapted to hold a tube and open on one side to emit light from a fluorescent tube placed therein, said first housing comprising,
two longitudinally extending side plates facing each other, arranged substantially symmetrically on both sides of an imaginary median plane,
first and second transversely extending end plates, arranged substantially perpendicularly to said median plane, and attached to said side plates,
at least one pair of first and second sockets, adapted to receive a fluorescent tube between said first and second sockets, said first socket mounted on said first end plate, and said second socket mounted on said second end plate,
a second housing containing a cavity, adapted to receive a transformer unit, connected to said second end plate, said second housing and said second end plate having openings adapted for the passage therethrough of electrical wiring,
means located in said first end plate adapted for the lengthwise insertion therethrough of a fluorescent tube into an initial position inside said first housing, and
guiding means adapted to guide the fluorescent tube from said initial into said final position.

4,493,013

SHATTER-PROOF LIGHTING FIXTURE

Kenneth R. Hawkins, 32738 River Rd., Gurnee, Ill. 60031

Filed Feb. 14, 1983, Ser. No. 466,001
Int. Cl.³ F21V 7/00
U.S. Cl. 362—307 5 Claims



1. A lighting fixture comprising

a unitary lamp housing and light-transmitting lens assembly fabricated of molded plastic,

said lens assembly comprising a generally dish-shaped pan including a diffuser plate and circumambient light-transmitting walls, said walls framing said plate and extending inwardly from and generally normally thereto,

a pair of opaque, wing-like panels displaced rearwardly with respect to said diffuser plate, said panels being integrally connected to and projecting from a corresponding pair of parallely extending inward edge portions of two opposed said walls framing said plate,

said panels extending generally normally of said walls and in a panel paralleling said diffuser plate,

an endless, opaque perimetric wall circumscribing said pan and said panels connected thereto, said wall being normal to a light-transmitting face of said diffuser plate,

an open-face chassis serving as a receptacle for lamps, lamp-holding sockets secured therewithin and ancillary electrical apparatus including circuit wiring,

said chassis having a rear principal face and a bounding circumambient wall and being sized for insertion slidably, wall first, into said housing and sleevingly to nest therewithin with said bounding wall of said chassis disposed interiorly of and in substantially contiguous abutment with said perimetric wall of said housing, and

generally trough-shaped, concave, removable reflector means of preformed self-sustaining shape for focusing and for intensifying illuminating light emanating from lighted lamps of said fixture,

retention means carried by and integral respectively with said chassis and with said reflector means for removably securing said reflector means functionally within said chassis to facilitate assembly of said fixture.

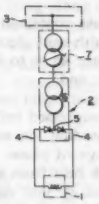
4,493,014

SUPERCONDUCTION STORAGE APPARATUS OF ELECTRICAL POWER

Shigenori Higashino, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1982, Ser. No. 384,171
Claims priority, application Japan, Jun. 3, 1981, 56-87278
Int. Cl.³ H02J 15/00
U.S. Cl. 363—14 1 Claim

1. A superconduction power storage apparatus comprising a superconduction coil for storage and release of an electrical energy, a separately excited thyristor conversion unit having d.c. terminals connected to said superconduction coil and a.c. terminals connected to an a.c. power source, said conversion unit being arranged for converting said electrical energy from a d.c. form to an a.c. form and vice versa between said superconduction coil and said a.c. power source, and an on-load voltage regulator connected between said a.c. terminals of said thyristor conversion unit and said a.c. power source, said voltage regulator being arranged for adjusting the voltage



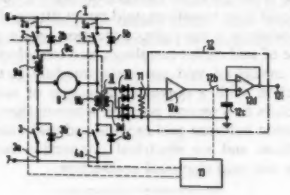
appearing at said a.c. terminals of the thyristor conversion unit and said thyristor conversion unit being phase controlled so as to regulate its d.c. output voltage at its d.c. terminals, wherein said on-load voltage regulator regulates its a.c. output voltage at its a.c. output terminals.

4,493,015

CIRCUIT ARRANGEMENT FOR DETERMINING THE LOAD CURRENT IN A REVERSIBLE D-C CONTROLLER OR CHOPPER

Franz Ramlohr, and Wolfgang Spitaler, both of Vienna, Austria, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 14, 1982, Ser. No. 449,833
Claims priority, application Austria, Dec. 21, 1981, 5487/81
Int. Cl.³ H02M 7/537
U.S. Cl. 363—63 5 Claims



1. In a circuit arrangement for determining the polarity of the load current in a reversible d-c controller having a bridge circuit which is connected across a d-c supply voltage source, said bridge circuit having four bridge arms, respective pairs of said bridge arms diagonally disposed in said bridge circuit, load current flowing to or from the d-c supply voltage source through the diagonally disposed bridge arms, each of said bridge arms including an antiparallel circuit comprising first electronic switch means and bypass diode means wherein two pairs of bridge arms respectively connected to the same bus of said supply voltage source each form a bypass circuit in which a measuring sensor is provided, the improvement comprising:

a current transformer having a secondary winding and having two primary windings provided as measuring sensors, said primary windings connected in opposite winding sense in respective ones of said bypass circuits in two of said diagonally disposed bridge arms;

rectifier means coupled to the secondary winding of said current transformer;

sample-and-hold means having an input coupled to said rectifier means, said sample-and-hold means including electronic sampling switch means;

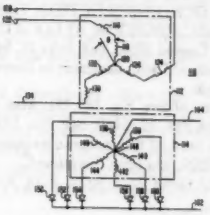
digital logic means coupled to said first electronic switch means so that said sampling switch means causes said sample-and-hold means to sample the signal present at the input of said sample-and-hold means during a predeter-

mined time in each time interval in which the load current circulates in either of the bypass circuits whereby a signal proportional to the actual value of the load current is formed at the output of said sample-and-hold means.

4,493,016
RECTIFIER TRANSFORMER

Edward J. Cham, Warren, Ohio, and Theodore R. Specht, Sharon, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 7, 1982, Ser. No. 433,322
Int. Cl.³ H02M 7/06
U.S. Cl. 363—126 **11 Claims**



1. A rectifier transformer circuit adapted for connection to a three-phase power frequency system for providing a rectified ac signal at a predetermined phase shift, without the necessity of using a phase shift transformer, or an interphase transformer, said rectifier transformer circuit comprising:

means providing a magnetic flux path circuit including a magnetic core having an iron flux return path;

electrical winding means;

said electrical winding means including a zig-zag wye primary winding adapted for connection to said three-phase power frequency system, and a single six-phase-star secondary winding:

said zig-zag wye primary winding including three coils each having a zig portion having N_1 turns and a zag portion having N_2 turns, with the number of said turns being selected to obtain a predetermined phase shift ϕ between said primary and secondary windings according to the relationship:

$$\phi = \frac{\arctan \sqrt{3}\ N_2}{2N_1 + N_2};$$

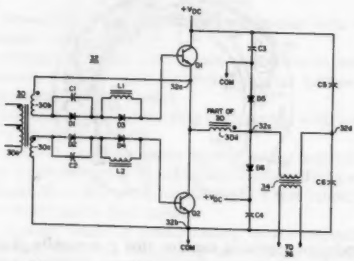
said six-phase star secondary winding having a common terminal and a plurality of output terminals, wherein said iron flux return path allows: (a) the voltage at said common terminal to oscillate, and (b) each phase of the secondary winding to carry current for one-third of a power frequency cycle;

and a plurality of rectifier means each having first and second terminals, said first terminals each being connected to one of said plurality of output terminals and said second terminals being connected together, such that said rectified ac signal is produced between said common terminal and said second terminals.

4,493,017
SINGLE DRIVE TRANSFORMER WITH REGENERATIVE WINDING FOR P.W.M. SUPPLY HAVING ALTERNATELY CONDUCTING POWER DEVICES

Neil A. Kammiller, Lakewood, and Nedyalko V. Ivanov, Lorain, both of Ohio, assignors to Reliance Electric Company, Cleveland, Ohio

Filed Jan. 24, 1983, Ser. No. 460,368
Int. Cl.³ H02M 7/537
U.S. Cl. 363—132 **9 Claims**



1. A single drive transformer for use in a switching power supply of the type which includes alternately conducting power switching devices, a driver circuit for generating p.w.m. driver signals for initiating the turnon and turnoff of said devices and power output means, said power switching devices being arranged to provide a current to said output means, said transformer comprising:

(a) primary winding means connected to said driver circuitry to receive said p.w.m. driver signals;

(b) secondary winding means connected to said alteranately conducting power switching devices and responsive to said signals on said primary means to provide to each of said alternately conducting switching devices a signal proportional to said driver signals; and

(c) regenerative winding means connected between said alternately conducting power devices and said power output means, said current flowing through said regenerative means in a manner such that said regenerative means provides through said secondary winding means a regenerative current to each of said devices, said regenerative current reinforcing said proportional signal when said driver signals initiate the turnon of the then nonconducting one of said devices.

4,493,018
CONDUCTOR SEPARATOR, WIRING HARNESS, AND RECTIFIER ASSEMBLY FOR AN ALTERNATOR INCLUDING SAME

Gary S. Hopmayer, Wilmette, and Charles Barone, Norwood Park, both of Ill., assignors to Mega International, Inc., Des Plaines, Ill.

Filed Sep. 30, 1982, Ser. No. 430,865
Int. Cl.³ H02M 1/00; H05K 7/02
U.S. Cl. 363—145 **14 Claims**

1. A rectifier assembly for use with an electrical power alternator, comprising:

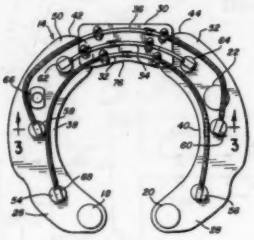
two planar rectifier plates arranged adjacent one another in a plane, the plates each carrying rectifier diodes for rectifying the electrical power of the alternator;

a conductor separator member arranged substantially between adjacent ends of the two plates, the member being generally planar and including at least one pair of upstanding means for retaining a conductor therein and at least one terminal passageway located between said pair of retaining means; and

at least one conductor having two opposed ends and a termi-

nal portion located therebetween, one end of the conductor being connected to a rectifier diode on one plate and the other end of the conductor being connected to a rectifier diode on the other plate, the conductor being engaged and retained in the pair of retaining means and the terminal portion passing through and extending beyond the passageway in said member.

8. A wiring harness for use in a rectifier assembly of an alternator, comprising:



a conductor separator member that is generally planar and includes at least one pair of integral retaining means for retaining a conductor therein, and one terminal passageway located between said pair of retaining means, said member being made of synthetic resin material; and

at least one conductor having two opposed ends and a terminal portion located therebetween, the conductor being engaged and retained in said pair of retaining means with said terminal portion passing through and extending beyond said passageway and the ends of said conductor extending beyond said member.

4,493,019

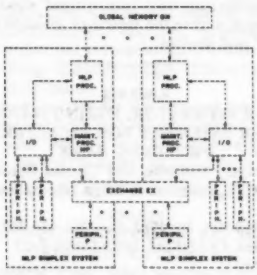
PIPELINED MICROPROGRAMMED DIGITAL DATA PROCESSOR EMPLOYING MICROINSTRUCTION TASKING

Dongsung R. Kim, Laguna Hills, and John H. McClintock, Jr., Mission Viejo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 6, 1980, Ser. No. 147,149

Int. Cl.³ G06F *9/28*

U.S. Cl. 364—200 **15 Claims**



Overall System

1. In a pipelined microprogrammed data processing system, the combination comprising:

microinstruction storage means for storing selectably addressable microinstructions;

instruction decoding means responsive to applied instructions for identifying particular ones of said microinstructions to be executed for performing said instructions;

microinstruction execution means for executing each microinstruction received from said microinstruction storage means in a plurality of at least three stages occurring over a plurality of consecutive time periods, one time period for each stage;

said microinstruction execution means including means for providing for the concurrent performance during each time period of the operations required for each of said plurality of stages in a pipelined manner such that the operations of each of said plurality of stages are performable with respect to a different microinstruction; and

microinstruction sequencing means responsive to microinstructions read out from said microinstruction storage means and to the results of microinstruction execution performed by said microinstruction execution means for providing next microinstruction address data;

said instruction decoding means including microinstruction addressing means responsive to said next microinstruction address data provided by said microinstruction sequencing means for addressing said microinstruction memory so as to provide a next microinstruction to said microinstruction execution means during each time period.

4,493,020

MICROPROGRAMMED DIGITAL DATA PROCESSOR EMPLOYING MICROINSTRUCTION TASKING AND DYNAMIC REGISTER ALLOCATION

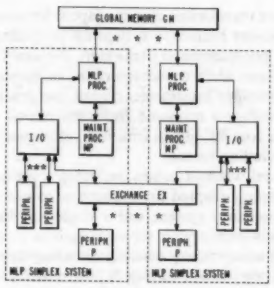
Dongsung R. Kim, Laguna Hills, and John H. McClintock, Jr., Mission Viejo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

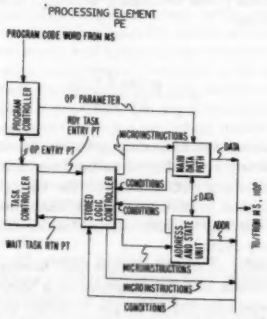
Continuation-in-part of Ser. No. 147,251, May 6, 1980,. This application Jul. 29, 1980, Ser. No. 173,379

The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.

Int. Cl.³ G06F *9/22, 9/28, 9/38, 9/46*

U.S. Cl. 364—200 OVERALL SYSTEM **10 Claims**





1. In a microprogrammed data processing system including

high level instruction storage means, the combination comprising:

task generation means for fetching high level instructions from said high level instruction storage means and in response thereto generating one or more tasks for performing each high level instruction, each task being in turn performable by the execution of one or more task microinstructions;

microinstruction storage means for storing selectably addressable task microinstructions for use in performing said tasks;

said task generating means being operative to access selected microinstructions from said microinstruction storage means;

microinstruction execution means for receiving and executing microinstructions selected from said microinstruction storage means by said task generating means; and

task control means responsive to said task generation means and to said microinstruction execution means for determining which tasks are ready for execution and for causing said task generation means to address said microinstruction storage means with addresses corresponding to ready task microinstructions, the order of addressing of microinstructions being chosen to allow for the execution of ready task microinstructions by said microinstruction execution means in an intermixed order regardless of the particular task to which each belongs so as to thereby provide for task multiprogramming at a microinstruction level; and

a plurality of dynamically allocatable registers for storing data required during execution of said tasks;

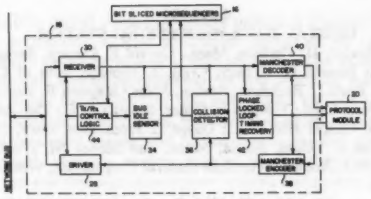
said task control means including register allocation means for monitoring the free and use states of said registers and in response thereto for dynamically assigning the registers required by each task during execution thereof.

4,493,021

MULTICOMPUTER COMMUNICATION SYSTEM

Anil K. Agrawal, Pasadena; Philip G. Mullen, Glendale, and Vivatvong V. Vadakan, Pasadena, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 3, 1981, Ser. No. 250,585
Int. Cl.³ G06F *15/16, 3/04*
U.S. Cl. 364—200 **5 Claims**



1. In apparatus for communication between a plurality of autonomous computers operated in a local area network using multimode addressing, each computer being connected to a single bus by a separate assigned network bus adapter, each adapter having a stored address code for each type of data it is to receive, each adapter comprising a data processing means programmed for carrying out all data handling and communication of its host computer with the bus, said processing means including means for data buffering, such that computers operating at different speeds in accordance with its protocol can send data to each other at their maximum speeds, an interface connecting said host computer to said processing means, protocol handling means connected to said data processing means for modifying the data handling protocol of the data being transmitted by said data processing means to a standard protocol and the data being received by said data processing means to the protocol of the host computer, means coupled to said protocol handling means for driving onto said bus data to be transmitted and for receiving data on said bus, and microprogrammed sequencing means for coordinating operation of said processing means, said protocol handling means and said transmitting and receiving means, whereby each adapter is a self-contained, autonomous unit for the protocol handling and network management of the data communications between any two or more computers wherein data transmitted is divided into packets by said processing means of the adapter assigned to the transmitting computer, an improvement comprising

said processing means providing each packet with a first uniquely encoded field,

each adapter provided with means responsive to said first uniquely encoded field for identifying the address code being used by each packet,

said processing means providing each packet with a second uniquely encoded field

said protocol handling means having means responsive to said second uniquely encoded field for identifying a mode selected from the group consisting of a first mode, a second mode and a third mode,

said protocol handling means having means responsive to said first mode for identifying said second uniquely encoded field as a physical destination address code identifying one or more of the computers for an information frame specified by said first encoded field,

said protocol handling means having means responsive to said second mode for identifying said second uniquely encoded field as a logical channel number, LCN, preestablished between two or more computers, and means responsive to said identification for establishing a logical channel number with said two or more computers and allowing communication therebetween without physical destination addressing,

said two or more computers being able to communicate after establishment of said logical channel number using said logical channel number as an address to which said two or more computers respond without physical destination addressing for a broadcast of information to said two or more computers specified by said first encoded field,

said protocol handling means having means responsive to said third mode for identifying said second uniquely encoded field as a data type identification code, and means responsive to said identification for permitting transmission of different types of data onto said bus without physical destination addresses and for permitting one or more computes to selectively receive data according to the type of data, thereby providing for a broadcast of data by type as specified by said first uniquely encoded field,

whereby data transmitted onto said bus is selectively accepted by different computers according to said first and second uniquely encoded field.

4,493,022

CENTRALIZED ARBITRATION PROCESS AND CENTRALIZED ARBITER FOR MULTIPROCESSOR SYSTEM

Alain Nicolas, and Jean-Pierre Chapelain, both of Colombes, France, assignors to Thomson-CSF Telephone, Paris, France

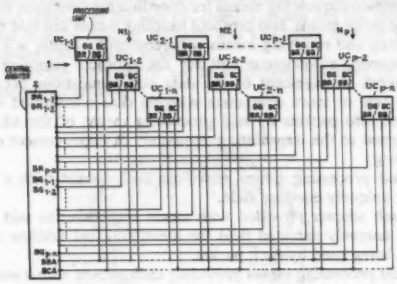
Filed May 4, 1981, Ser. No. 260,108
Claims priority, application France, May 6, 1980, 80 10086
Int. Cl.³ G06F *15/16*
U.S. Cl. 364—200 **8 Claims**

1. A synchronously operated process for the centralized arbitration of a plurality of processing units in a multi-processor system wherein said processor units are divided into a plurality of levels, comprising the steps of:

generating a predetermined main timing cycle;

cyclically attributing, in accordance with said main cycle, at leasts one priority to each of said levels;

generating a plurality of predetermined secondary timing cycles witheach seconary timing cycle being associated with a corresponding one of said plurality of levels;



cyclically attributing to each of said processing units within each of said levels at least one priority in accordance with said corresponding one of said secondary cycles.

4,493,023

DIGITAL DATA PROCESSING SYSTEM HAVING UNIQUE ADDRESSING MEANS AND MEANS FOR IDENTIFYING AND ACCESSING OPERANDS

Edward S. Gavrin, Lincoln; Richard G. Bratt, Wayland, both of Mass.; Stephen I. Schleimer, Chapel Hill, N.C.; John F. Pilat, Raleigh, N.C.; Michael S. Richmond, Pittsboro, N.C.; Walter A. Wallach, Jr., Raleigh, N.C.; Richard A. Belgard, Saratoga, Calif.; David A. Farber, Durham, N.C.; John K. Ahlstrom, Mountain View, Calif.; Steven J. Wallach; Gerald F. Clancy, both of Saratoga, Calif.; Craig J. Mundie, Cary; Thomas M. Jones, Chapel Hill, both of N.C.; Brett L. Bachman, Boston, and David H. Bernstein, Ashland, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed May 22, 1981, Ser. No. 266,403
Int. Cl.[3] G06F *9/30*
U.S. Cl. 364—200 **2 Claims**

1. In a digital computer system including processor means for performing operations upon operands, memory means for storing said operands and instructions for directing said operations, said memory means being organized into objects for containing said operands and said instructions, bus means for conducting operands and instructions between said memory means and said processor means, and input/output (I/O) means for conducting operands between said digital computer system and devices external to said digital computer system, said processor means comprising:

arithmetic logic unit (ALU) means connected to said bus means for performing said operations,

addressing means connected to said bus means for providing addresses and for controlling the transfer of said operands and instructions between said memory means and said processor means, each of said addresses comprising

an object field for identifying a corresponding one of said objects,

an offset field for specifying a first number of information bits of offset relative to the start of said corresponding one of said objects, and

a length field for specifying a second number of information bits of said corresponding one of said objects following said first number of information bits to be transferred between said memory means and said processor means, and

microcode control means for storing sequences of microinstructions for controlling said processor means and responsive to said instructions for providing said sequences of microinstructions to said processor means,

said ALU means including

general register file means connected to said bus means for storing selected operands and selected addresses,

said general register file means comprising a plurality of vertically ordered registers vertically divided into three parallel-operating and addressed parts,

a first said part of said general register file means comprising first register file means for storing object fields of said addresses,

a second said part of said general register file means comprising second register file means for storing offset fields of said addresses and said selected operands, and

a third said part of said general register file means comprising third register file means for storing length fields of said addresses, and

address ALU means connected to said general register file means and to said bus means and responsive to first selected sequences of microinstructions for performing operations on said selected addresses,

each of said operands being referred to by a corresponding name of a plurality of names and said memory means including name table means for storing name table entries, each of said name table entries corresponding to one of said names and comprising (1) first data resolvable to provide a location in said memory means of an operand referred to by said corresponding name, and, (2) second data resolvable to identify the format of said operand referred to by said corresponding name,

said ALU means including means connected to said bus means and responsive to said names for reading said name table entries corresponding to said names from said name table means, and

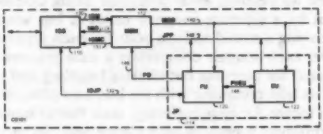
means connected to said reading means for resolving said name table entries and for providing addresses corresponding thereto to said memory means, each said address representing a location in said memory means of the operand referred to by its corresponding name.

4,493,024

DIGITAL DATA PROCESSING SYSTEM

Ward Baxter, II, Carlisle, Mass.; Gerald F. Clancy, Saratoga, Calif.; Ronald H. Gruner; Craig J. Mundie, both of Cary, N.C.; Brett L. Bachman, Boston, Mass.; Stephen R. Redfield, San Jose, Calif.; William N. Coder, Raleigh, N.C.; Thomas M. Jones, Chapel Hill, N.C.; David L. Houseman, Cary, N.C.; Charles J. Young, Berlin, Mass., and Steven M. Haeffele, Cary, N.C., assignors to Data General Corporation, Westboro, Mass.

Filed May 22, 1981, Ser. No. 266,406
Int. Cl.[3] G06F *13/00*
U.S. Cl. 364—200 **7 Claims**



2. A digital computer system, comprising:

processor means for performing operations upon operands,

memory means for storing operands and instructions for directing the operations of said processor means,

said processor means responsive to the instructions directing said operations,

bus means for conducting instructions and operands between said memory means and said processor means, and

I/O means for conducting operands between said memory means and devices external to said digital computer system, said I/O means including:

channel means connected from said external devices for conducting operands to and from said external devices,

I/O bus means connected between said channel means and a selected part of said memory means for conducting operands between said channel means and said memory means, and

addressing means connected to said I/O bus means and responsive to the operation of said channel means and said memory means for providing addresses for controlling the reading of operands from said memory means and the writing of operands into said memory means,

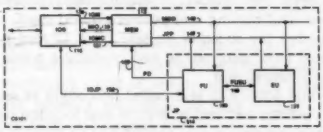
said memory means and said channel means responsive to said addresses for conducting operands between said memory means and said external devices.

4,493,025

DIGITAL DATA PROCESSING SYSTEM USING UNIQUE MEANS FOR COMPARING OPERATIONAL RESULTS AND LOCATIONS AT WHICH SUCH RESULTS ARE TO BE STORED

Brett L. Bachman, Boston, Mass.; James T. Nealon, Cary, N.C., and Charles J. Young, Berlin, Mass., assignors to Data General Corporation, Westboro, Mass.

Filed May 22, 1981, Ser. No. 266,412
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **1 Claim**



1. In a digital computer system including processor means for performing at least arithmetic operations on operands, memory means for storing at least instructions for directing the arithmetic operations performed by said processor means, first bus means for conducting said instructions and the results of said arithmetic operations between said memory means and said processor means, and further bus means for conducting operands between devices external to said digital computer system and said digital computer system, said processor means comprising:

ALU means connected to said first bus means and responsive to said instructions for performing arithmetic operations on said operands,

addressing means connected to said first bus means and responsive to the operation of said ALU means for providing addresses specifying locations in said memory means to which the results of said arithmetic operations can be transferred,

each address including a length field, and

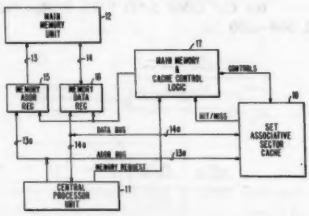
checking means responsive to the results of the operation of said ALU means to the length field of an address for comparing the number of data bits specified by said length field and the number of data bits in said results and indicating when the number of data bits specified by said length field is not equal to the number of data bits in said results.

4,493,026

SET ASSOCIATIVE SECTOR CACHE

Howard T. Olnowich, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 26, 1982, Ser. No. 382,040
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **7 Claims**



1. In a data processing system including a main memory divided into sectors, each sector of the main memory including a plurality of data blocks, each data block including a plurality of data word locations, a cache memory and control means for temporarily storing selected ones of said plurality of data blocks, and a processor means connected to said main memory and to said cache memory and control means for processing data, for issuing memory addresses, and for fetching blocks of data from the cache memory or from said main memory in accordance with the issued memory addresses, said cache memory and control means comprising:

an initialization control for developing an output signal representing initialization control signals;

data array means for temporarily storing the selected ones of said plurality of data blocks;

tag array means for storing a plurality of address information therein indicative of the addresses in said main memory of the selected data blocks temporarily stored in said data array means, said address information including sector address data representative of a desired sector of said main memory wherein the data is stored, block address data representative of a desired data block of the desired sector wherein the data is stored, and validity bit data representative of the existance of the data in a desired word location of the desired data block; and

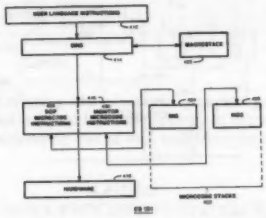
validity bit revision means connected to an output from said initialization control, connected to an output from said tag array means representative of said validity bit data of said address information stored therein, and responsive to a portion of the memory address issued by said processor means for revising and changing one or more of the validity bits of said validity bit data stored in said tag array means during an initialization period in response to said output signal from said initialization control and in accordance with said portion of the memory address issued by said processor means.

4,493,027

METHOD OF PERFORMING A CALL OPERATION IN A DIGITAL DATA PROCESSING SYSTEM HAVING MICROCODE CALL AND RETURN OPERATIONS

Lawrence H. Katz, Oregon City, Oreg.; Douglas M. Wells, Chapel Hill; Michael S. Richmond, Pittsboro, both of N.C.; Richard A. Belgard, Saratoga, Calif.; Walter A. Wallach, Jr., Raleigh, N.C.; David H. Bernstein, Ashland, Mass.; John K. Ahlstrom, Mountain View, Calif.; John F. Pilat, Raleigh; David A. Farber, Durham, both of N.C.; Richard G. Bratt, Wayland, Mass., and Brett L. Bachman, Boston, Mass., assignors to Data General Corporation, Westboro, Mass.

Filed May 22, 1981, Ser. No. 266,526
Int. Cl.³ G06F 3/00, 9/22, 9/36, 9/46
U.S. Cl. 364—200 1 Claim



1. In a digital computer system comprising processor means for performing operations in response to instructions, memory means responsive to signals from said processor means comprising means for storing data comprising at least said instructions, and means for conducting at least said data between said memory means and said processor means and said signals from said processor means to said memory means, and

wherein said instructions further comprise low-level instructions and high-level instructions, said processor means responds to a said high-level instruction by executing a sequence of said low-level instructions, said high-level instructions comprise operation codes specifying a sequence of said low-level instructions, names representing operands, and literal values containing integers,

said data further comprises (1) procedures comprising sequences of said high-level instructions, (2) pointers representing locations in said memory means, (3) name tables associated with said procedures comprising at least one name table entry comprising operand information for an operand represented by a said name in a said instruction in a said procedure associated with said name table, said operand information comprising at least information from which said operand's location in said memory means may be calculated, (4) procedure environment descriptors associated with said procedures comprising at least a name table pointer representing the location of a said name table associated with a said procedure, (5) procedure execution state areas containing data for individual executions of a said procedure by a user of said digital computer system, and (6) stacks comprising sequences of said procedure execution state areas for said procedures executed by said user,

said processor means contains at least (1) procedure control state comprising at least (a) the location of said high-level instruction currently being executed and (b) the location of said procedure execution state area for said procedure whose said instructions are currently being executed by said processor means, and (2) low-level instruction sequence control state comprising at least the location of said low-level instruction currently being executed and data required to execute said low-level instruction for said sequence of low-level instructions currently being executed by said processor means,

said high-level language instructions include at least (1) a call instruction comprising an operation code, a said name representing a said pointer to a called said procedure, a literal value specifying the number of arguments, and a said name representing each argument, which, when executed in a calling said procedure by said processor means, causes an execution of said called procedure for a said user to begin, and (2) a return instruction comprising only an operation code which, when executed by said processor means, causes an execution of a said called procedure for a said user to terminate and said execution of said calling procedure to resume,

said low-level instruction sequences comprise at least (1) a call instruction sequence for executing said call instruction, (2) a return instruction sequence for executing said return instruction, (3) a name resolution sequence executable by other said low-level instruction sequences for calculating the location in said memory means of a said operand represented by a said name from said operand information in said name table entry specified by said name, (4) a name evaluation sequence executable by other said low-level instruction sequences for obtaining the value of a said operand represented by a said name from said memory means and returning it to said processor means, (5) a general call sequence executable by other said low-level instruction sequences requiring a first certain said pointer to a certain said procedure and a second certain said pointer to certain data to be used in the execution of said certain procedure as input for causing said processor means to begin the execution of said procedure specified by said first certain pointer,

the method of executing a said call instruction comprising the steps of:

executing said name evaluation sequence to evaluate said name in said call instruction representing said pointer to said called procedure to obtain said pointer to said called procedure,

obtaining said integer from said literal value in said call instruction,

for as many said names as are specified by said literal value, for each said name, executing said name resolution sequence to resolve said name, using said calculated location to create a said pointer to said operand represented by said name, and placing said pointer on said stack,

calculating the location on said stack of said pointers obtained from said names, and producing a said pointer to said location, and

using said pointer to said called procedure as said first certain pointer and said pointer to said location on said stack of said pointers as said second certain pointer and executing said general call sequence, whereby said processing means responds to said general call sequence by executing further steps comprising

(a) saving state comprising at least said procedure control state on said procedure execution state area for said execution of said calling procedure,

(b) saving state comprising at least said low-level instruction sequence execution state for said call instruction sequence executing said general call sequence on said low-level instruction sequence state area associated with said procedure execution state area for said execution of said procedure,

(c) locating said procedure specified by said first certain pointer,

(d) making a said procedure execution area on said stack for said called procedure including at least said pointers obtained from said names,

(e) obtaining said procedure control state for said called procedure and loading said procedure control state into said processor means,

(f) causing the first said high-level instruction of said procedure specified by said first certain pointer to begin execution,

(g) on execution of a return instruction in said called procedure, reloading state comprising at least (1) said saved procedure control state from said calling procedure's execution state area and (2) said saved low-level instruction sequence control state from said calling

procedure's low-level instruction sequence state area into said processor means, and

(h) causing the next said low-level instruction of said call instruction sequence to be executed.

4,493,028

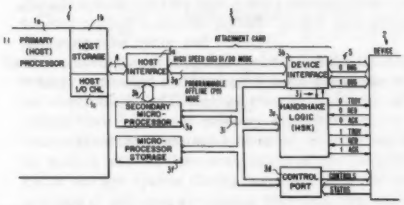
DUAL MODE I/O

Chester A. Heath, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 2, 1982, Ser. No. 345,161

Int. Cl.³ G06F *3/00, 15/06*

U.S. Cl. 364—200 9 Claims



1. A method of conducting distributed data processing operations in a data processing system containing primary and secondary subsystems, said secondary subsystem having at least one device attached thereto and operating as an I/O controller for transferring data between said primary subsystem and said device, each subsystem having a respective processing facility for performing logical data processing operations and having an associated memory facility to which it refers exclusively for fetching and storing data on which its logical data processing operations are conducted, said method comprising:

in a first discrete process involving interaction between the processing facilities of said primary and secondary subsystems, transferring a unit of primary command information from said primary subsystem to said memory facility associated with said secondary subsystem, said command information unit comprising program information defining a plurality of storage areas in the memory facility associated with said primary subsystem, said areas being potentially separate from each other and potentially having different data storage capacities;

in a second discrete process defined by said primary command unit, and involving interaction between said secondary subsystem and only the memory facility associated with said primary subsystem, transferring a program of secondary commands from said primary subsystem to said memory facility associated with said secondary subsystem, said secondary commands being defining data transfer operations between said memory facility associated with said secondary subsystem and both said at least one device and said plurality of storage areas, as well as logical processing operations to be conducted on data contained in said memory facility associated with said secondary subsystem;

in a third discrete process, in response to said secondary commands, performing any of the following operations: transferring sets of data in one or the other or both directions between said plurality of data storage areas and said memory of said secondary subsystem, transferring sets of data in one or the other or both directions between said memory of said secondary subsystem and said device, and performing a logical data processing operation on data contained in at least one of said transferred data sets.

4,493,029

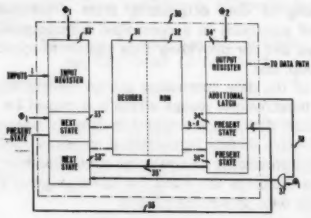
MICROPROCESSOR WITH PLA ADAPTED TO IMPLEMENT SUBROUTINES

Mark E. Thierbach, Lincroft, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 14, 1982, Ser. No. 378,403

Int. Cl.³ G06F *9/22*

U.S. Cl. 364—200 8 Claims



1. A finite state machine having at least first and second phases of operation, separate input and output means for applying inputs to and for generating outputs from said finite state machine during said first and second phases, respectively, first feedback means connected between said output means and said input means for applying to said input means data representative of a next state of said finite state machine, second feedback means also connected between said output means and said input means for applying to said input means data also representative of a next state of said finite state machine, said finite state machine also including control means responsive to a first signal for inhibiting said second feedback means, thus controllably storing data applied by said second feedback means.

4,493,030

PLURAL DATA PROCESSOR GROUPS CONTROLLING A TELECOMMUNICATIONS EXCHANGE

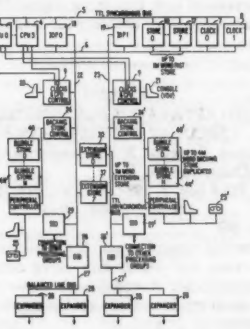
Stuart Barratt, and Anthony P. Lumb, both of Warwickshire, England, assignors to The General Electric Company p.l.c., England

Filed May 19, 1982, Ser. No. 379,617

Claims priority, application United Kingdom, May 29, 1981, 8116449

Int. Cl.³ G06F *15/16, 15/20*

U.S. Cl. 364—200 10 Claims



1. A data processing arrangement for use in the control of telecommunications exchange apparatus comprising

(A) a plurality of data processing groups

(i) each having a fast access data store individual to that group,

(B) a plurality of data processing units,

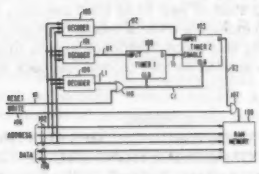
(C) a first data bus, all of said data processing units having direct access to said store by way of the first data bus and being of parallel operation on data stored therein,
(D) a second data bus, and
(E) first input/output means connected on one side to the first data bus and on the other side to the second data bus for transferring data signals between the data processing units and exchange apparatus,
(F) each of the data processing groups being dedicated to the processing of data originating from a predetermined group of apparatus in a controlled telecommunications exchange and for providing data signals to apparatus of that group, and
(G) each of the data processing groups having respective further input/output means which is accessed by way of said second data bus and which is directly connected to the respective further input/output means of each of the other data processing groups in the controlled telecommunications exchange to permit the interchange of data between the data processing groups.

4,493,031

MEMORY WRITE PROTECTION USING TIMERS

Vincent J. Silverio, Middletown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 25, 1982, Ser. No. 411,270
Int. Cl.³ G06F 7/00
U.S. Cl. 364—200 **10 Claims**



1. A memory write-enable circuit comprising:
first means responsive to a first input signal for generating an enable signal, and
a second means responsive to said enable signal and to a second input signal received within a first predetermined time interval of said first input signal for generating a write-enable signal for enabling the writing of data into a memory.

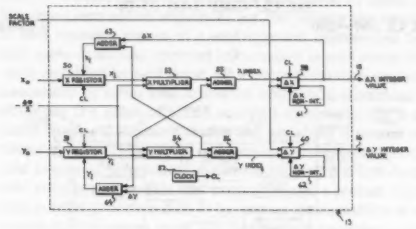
4,493,032

METHOD AND APPARATUS FOR POSITIONING USING CIRCULAR INTERPOLATION

Brian C. Johnson, Syracuse, N.Y., assignor to General Electric Company, Charlottesville, Va.

Filed Sep. 7, 1982, Ser. No. 415,745
Int. Cl.³ G05B 19/25
U.S. Cl. 364—169 **17 Claims**

8. In a numerical control system for a machine tool, apparatus for generating and distributing move control signals to mutually perpendicular X and Y axis drive mechanisms to effect incremental motion of the tool along a circular arced path, comprising:
means for providing input signals representative of the initial X and Y coordinates of said path, the change in arc angle $\Delta\theta$ per incremental move, and a scale factor indicative of a modulus proportional to the radius R of the circular arc;
means for determining, at any instant of time, a present X-coordinate distance of the tool from the arc center to produce an X_i signal indicative of such distance;
means for determining, at any instant of time, a present Y-coordinate distance of the tool from the arc center to produce a Y_i signal indicative of such distance;
first means receiving said X_i signal and said $\Delta\theta$ signal to produce a first product signal indicative of the product of X_i and a cosine function of $\Delta\theta$;
second means receiving said Y_i signal and said $\Delta\theta$ signal to produce a second product signal indicative of the product of Y_i and a cosine function of $\Delta\theta$;
first adder means receiving said first product signal and said Y_i signal for summing such signals to produce an X-index signal;



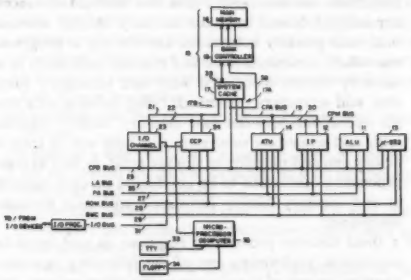
second adder means receiving said second product signal and said X_i signal for summing such signals to produce a Y-index signal;
an X-scaling means receiving said X-index signal and said scale factor for scaling said X-index by said scale factor to produce a move control signal causing an incremental movement of the tool by a distance ΔX in the X direction; and
a Y-scaling means receiving said Y-index signal and said scale factor for scaling said Y-index by said scale factor to produce a move control signal causing an incremental movement of the tool by a distance ΔY in the Y direction.

4,493,033

DUAL PORT CACHE WITH INTERLEAVED READ ACCESSES DURING ALTERNATE HALF-CYCLES AND SIMULTANEOUS WRITING

Michael L. Ziegler, Whitinsville, and Michael B. Druke, Chelmsford, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Continuation of Ser. No. 143,974, Apr. 25, 1980, abandoned.
This application Dec. 6, 1982, Ser. No. 447,105
Int. Cl.³ G06F 9/00, 13/00
U.S. Cl. 364—200 **7 Claims**



1. A data processing system having a memory system, said memory system comprising
a main memory storage means for storing a first plurality of blocks of data words;
an intermediate cache storage system including
data store means for storing a second plurality of blocks of

data words corresponding to a predetermined number of said first plurality of blocks of data words stored in said main memory storage means;

first address and data ports providing access to said intermediate cache storage system by first selected data request sources; and

second address and data ports providing access to said intermediate cache storage system by second selected data request sources;

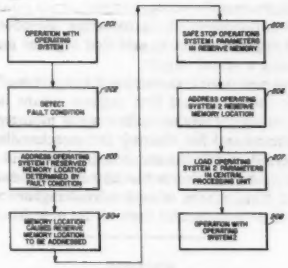
timing control means for enabling said first address and data ports for providing access to said intermediate cache storage system only by said first selected data request sources during a first portion of any data processing operating time cycle and for enabling said second address and data ports for providing access to said intermediate cache storage system only by said second selected data request sources during a second portion of any data processor operating time cycle; and

further control means connected between said main memory storage means and said intermediate cache storage system for controlling the sequential transfer of blocks of data words from said main memory storage system to said intermediate cache storage system, so that data words can be written into the data store means of said intermediate cache storage system during both said first and second portions of said data processing operating time cycle.

4,493,034
APPARATUS AND METHOD FOR AN OPERATING SYSTEM SUPERVISOR IN A DATA PROCESSING SYSTEM

Phillip A. Angelle, Glendale; Marion G. Porter, and James L. King, both of Phoenix, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Oct. 14, 1982, Ser. No. 434,344
Int. Cl.³ G06F *9/00*
U.S. Cl. 364—200 **17 Claims**


OPERATION WITH OPERATING SYSTEM 1
DETECT FAULT CONDITION
ADDRESS OPERATING SYSTEM 1 RESERVED MEMORY LOCATION DETERMINED BY FAULT CONDITION
MEMORY LOCATION CAUSED RESERVE MEMORY LOCATION TO BE ADDRESSED
SAFE STOP OPERATIONS SYSTEM 1 PARAMETERS IN RESERVE MEMORY
ADDRESS OPERATING SYSTEM 2 RESERVE MEMORY LOCATION
LOAD OPERATING SYSTEM 2 PARAMETERS IN CENTRAL PROCESSING UNIT
OPERATION WITH OPERATING SYSTEM 2

1. A method of providing a supervisor for a data processing system utilizing a plurality of operating systems comprising the steps of:

(a) identifying a data processing system state requiring activation of a different operating system;

(b) safestoring contents of registers defining a state of a central processing unit of said data processing unit in a reserve memory associated with a currently active operating system;

(c) addressing a reserve memory associated with said different operating system,

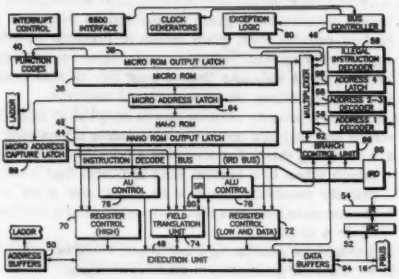
(d) entering in said state defining registers of said central processing unit an address of said different operating system reserve memory, an address in a page table directory, data in registers of said central processing unit establishing a predetermined state of said data processing system, and data establishing a decor for said central processing unit determined by said different operating system; and

(e) initiating operation of said different operating system.

4,493,035
DATA PROCESSOR VERSION VALIDATION

Douglas B. MacGregor; William C. Moyer, both of Austin, Tex.; Marvin A. Mills, Jr., Indiatlantic, Fla., and John E. Zolnowsky, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 7, 1982, Ser. No. 447,600
Int. Cl.³ G06F *15/16, 15/06*
U.S. Cl. 364—200 **3 Claims**



1. In a data processor of a predetermined type and adapted for connection to a memory, comprising:

instruction execution control means for controlling the execution by said data processor of a plurality of instructions, at least one of said instructions being subject to the occurrance of an exception condition during the execution thereof; and

exception handling means coupled to said instruction execution control means and responsive to the occurrance of said exception condition during the execution of said one instruction, for storing in said memory a set of information indicative of the state of said instruction execution control means as of the time said exception condition occurs, said exception handling means retrieving from said memory said stored set of state information after said exception condition has been resolved, and, in response to receiving a control signal, restoring the state of said instruction execution control means using said retrieved set of state information;

the improvement comprising: validation means coupled to said exception handling means, for providing to said exception handling means for storage as a portion of said set of said state information a predetermined validation code indicative of said predetermined type of data processor, said validation means verifying that said set of state information retrieved by said exception handling means contains said predetermined validation code, and providing said control signal to said exception handling means only in response to verifying that said retrieved state information contains said predetermined validation code.

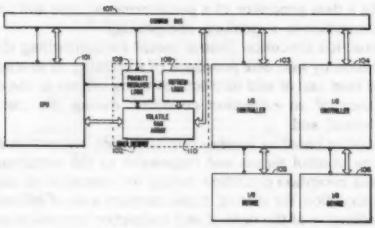
4,493,036
PRIORITY RESOLVER HAVING DYNAMICALLY ADJUSTABLE PRIORITY LEVELS

Daniel A. Boudreau, and Edward R. Salas, both of Billerica, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 14, 1982, Ser. No. 449,702
Int. Cl.³ G06F *9/46*
U.S. Cl. 364—200 **19 Claims**

1. An apparatus for resolving priority between competing requests for a shared resource comprising:

A. a lowest priority level logic comprising:
  a. an ask means for receiving a request signal indicating that the lowest priority desires use of said shared resource,
  b. a grant means coupled to received an output of said ask means,
B. a highest priority level logic comprising:
  a. an ask means for receiving a request signal indicating that the highest priority level desires to use the shared resource,
  b. a late request inhibit means coupled to receive an output of said ask means,
  c. a grant means coupled to receive a output of said late request inhibit means,
C. a cycle initiate means coupled to receive an output of said lowest priority level grant means and an output of said highest priority level grant means to produce an initiate signal wherein said initiate signal ouput by said cycle initiate means indicates that at least one of said priority levels is requesting use of said shared resource,
D. an inverse priority control means coupled to said grant means and said late request inhibit means comprising:
  a. a receiving means for receiving a priority control signal which when in a normal state indicates that a normal priority resolution cycle is to occur and when in an inverse state indicates that an inverse priority resolution cycle is to occur,
  b. a means for generating a late request inhibit signal, and
  c. a means for generating a grant reset signal,



wherein during said normal priority resolution cycle said late request inhibit signal enables said request inhibit means to pass said request signal before said grant reset signal enables said grant means and wherein during said inverse priority resolution cycle said late request inhibit signal enables said late request inhibit means after said grant reset signal

E. a delay means for producing a delayed initiate signal by delaying the output of said cycle initiate means a sufficient time to allow any of said grant flip-flops to set that is going to set in a priority resolution cycle.
F. a lowest priority winner means coupled to receive said output of said priority grant means and the output of said delay means to produce a low win signal that indicates said lowest priority level has won use of said shared resource if no higher priority level grant flip-flop has been set once said delayed initiate signal is produced by said delay means, and
G. highest priority winner means coupled to receive said output of said highest priority grant means and said delayed initiate signal for producing a high win signal indicating that said highest priority level has won use of said shared resource if said highest priority grant means is set when said delayed initiate signal appears,

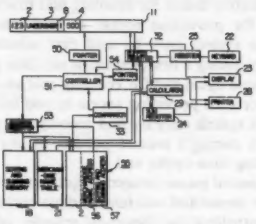
wherein said lowest priority level logic has the shortest path to said cycle initiate means and can initiate a shared resource cycle quicker than any other of said priority levels and wherein said initiate signal is produced before a final winner of the shared resource is determined.

4,493,037

RETAIL TERMINAL

Kazukiyo Takano, Seto, and Keigi Koga, Isehara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 4, 1981, Ser. No. 327,628
Claims priority, application Japan, Dec. 10, 1980, 55-173281
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—405 **2 Claims**



1. A retail terminal for registering data from various items of merchandise, comprising:
(a) input means for inputting data for each item of merchandise, including at least a merchandise code, the cost of the merchandise, number of items of the merchandise, and function information;
(b) first register means for temporarily storing at least the data inputted from said input means;
(c) second register means for storing the merchandise data stored in said first register means for a plurality of items of the merchandise;
(d) memory means connected to said second register means for storing total cost and total number of items of the merchandise for the respective items of the merchandise;
(e) calculator means connected to said second register means and said memory means for calculating a sum amount of money and a total amount of the merchandise for each item of the merchandise;
(f) means for sequentially transferring the contents of said second register means to said first register means and for producing a visual output;
(g) control means for transferring the contents of said second register means to said first register means item by item based on said function information inputted from said input means and for clearing the merchandise data from said second register means item by item; and
(h) pointer means connected to said control means for pointing to a storage area of said second register means to be allocated to a particular item of the merchandise.

4,493,038

DATA RECORDING MACHINE

Michele Bovio, Brosso, and Walter Gillone, Ivrea, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Dec. 23, 1981, Ser. No. 333,937
Claims priority, application Italy, Dec. 24, 1980, 68977 A/80; Dec. 24, 1980, 68978 A/80
Int. Cl.³ G06F *11/00*
U.S. Cl. 364—405 **17 Claims**

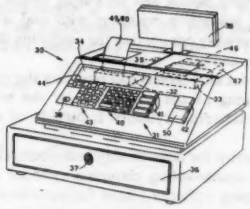
1. In a transactions recording machine comprising: a frame; a keyboard including numeric and service keys for entering and executing transactions and selector means actuatable for defining either a recording status for enabling the recording and execution of said transactions or a check status for reporting the recorded transactions; printing means for printing said transactions; and electronic means for controlling records, executions, reports and printing of said transactions, wherein said electronic means are removably mounted on said frame and include totalizing memory means for storing totals of said transactions, wherein said electronic means respond to one of said service keys in the record status of the machine for causing

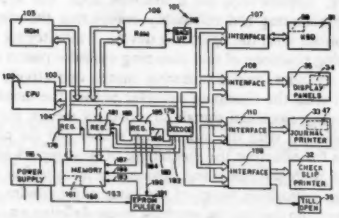
said printing means to print the executed transactions on till receipts and wherein said electronic means respond to the actuation of said selector means in said check status for the actuation of said selector means in said check status for causing said printing means to print the report of the recorded transactions on check slips, the improvement comprising:

counting means for counting signals in a purely incremental and non-manipulatable manner;

fixing means for permanently and non-manipulatably fixing said counting means to the machine frame;

incrementing means controlled by said electronic means and responsive to each actuation of said selector means in said





check status for incrementing the content of said counting means, whereby each actuation of the selector means in the check status is stored permanently and not cancellably;

means for reading-out the content of said counting means; and

means responsive to the actuation of said selector means in said check status and to the read-out content of said counting means for causing the printing on the check slip of the total of the previous actuations of said selector means in the check status and the content of said totalizing memory means.

4,493,039

APPARATUS AND METHOD FOR IMAGE REPRODUCTION OF MATERIALS USING THEIR MAGNETIC AND ELECTRIC PROPERTIES

William D. Gregory, NE. Vienna, Va., assignor to President and Directors of Georgetown University, Washington, D.C.

Filed May 6, 1980, Ser. No. 147,297

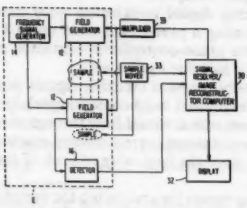
Int. Cl.³ G06F *15/42*

U.S. Cl. 364—414 **17 Claims**

1. Apparatus for generating an image of a material using at least one of its magnetic, electric permeability and conductance properties under substantially hazard-free field conditions and without establishing physical contact with the material, said apparatus comprising:

(a) electromagnetic field generating means for generating a relatively low-strength substantially hazard-free electromagnetic field and for producing an output signal when the material to be investigated is brought within the influence of said electromagnetic field and out of physical contact with said electromagnetic field generating means, said output signal having a value which is reflective of said at least one of the magnetic, electric permeability and conductance properties of at least one volume element of said material, said at least one volume element being defined by at least one of intersecting field lines of said electromagnetic field and intersecting planes of said material;

(b) frequency generating means connected to said electromagnetic field generating means for producing a frequency signal comprising a plurality of pre-selected frequencies, said frequency signal being applied to said electromagnetic field generating means for generating said electromagnetic field;



(c) output signal resolving means connected to said electromagnetic field generating means for resolving said output signal into separate resolved component values including a resolved reactive component value and a resolved non-reactive component value to said at least one volume element of said material for each of said pre-selected frequencies; and

(d) image generating means connected to said output signal resolving means for generating a pictorial image of said material from at least one of said resolved component values for at least one volume element, said pictorial image being reflective of said at least one of the magnetic, electric permeability and conductance properties of said at least one volume element.

4,493,040

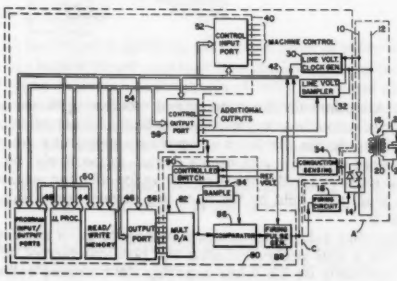
APPARATUS AND METHOD OF PHASE CONTROL FOR RESISTANCE WELDING AND OTHER RESISTIVE-INDUCTIVE LOADS

Peter W. Vanderhelst, Birmingham, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Jun. 1, 1982, Ser. No. 383,829

Int. Cl.³ G06G *7/64*; B23K *11/24*

U.S. Cl. 364—477 **23 Claims**



1. A computer-controlled welding apparatus comprising:

a phase-controllable contactor means for selectively conducting AC electric power to a welding load means, the

electric power including a plurality of cyclically occurring voltage half line cycles;

a line voltage clock generator for generating clocking signals at a preselected point in each of the voltage half line cycles of the AC electric power, the clocking signals being indicative of the beginning of each half line cycle;

a conduction sensing means for producing a conduction signal which indicates whether the contactor means is conducting welding power to the welding load means, the conduction sensing means being operatively connected with at least one of the contactor means and the load means;

a digital computer operatively connected with the line voltage clock generator and the conduction sensing means, the digital computer:

producing digital preselected weld current signals each indicating a preselected weld current to be conducted by the phase-controllable contactor means during one of the half line cycles, and

repeatedly between clocking signals producing real time digital present weld current signals indicating the weld current which would flow through the contactor means if the contactor were rendered conductive at a present time since the beginning of each of the half line cycles; and,

comparing means for comparing the preselected and a corresponding present weld current signals, the comparing means being operatively connected with the contactor means for selectively causing the contactor means to conduct welding power to the welding load means.

4,493,041

METHOD AND APPARATUS FOR DETERMINING THE WORKING RANGE OF A DOUBLE-ACTING CLAMPING CYLINDER FOR ACTUATING CHUCKING DEVICES ON MACHINE TOOLS

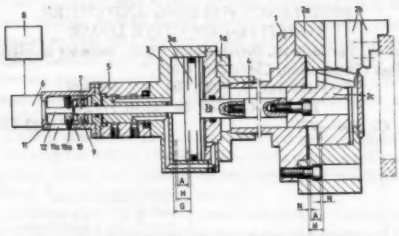
Herbert Antoni, Grevenbroich, Fed. Rep. of Germany, assignor to Paul Forkardt GmbH & Co, KG, Düsseldorf, Fed. Rep. of Germany

Filed Feb. 9, 1982, Ser. No. 347,201

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1981, 3105872

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—474 **10 Claims**



1. A method for determining and monitoring the working range of a double-acting clamping cylinder for actuation of an operating device, the latter comprising a supporting device, a centering device or a clamping device, respectively, on machine tools, and with control of a drive for effecting machining of a workpiece held by the operating device, comprising the steps of

providing a detecting means, actuating the latter and detecting a total stroke, including end positions thereof, of the operating device when actuating the clamping cylinder, said end positions being inside a total path of displacement of the clamping cylinder without the operating device,

providing a control device and storing in said control device said end positions of said total stroke, and

determining a working range of the clamping cylinder for the operating device by providing subtraction means and subtracting a post-tightening stroke associated with said operating device from the total stroke, said post-tightening stroke associated with the operating device being a predetermined distance so as to guarantee that a sufficient holding of the workpiece by the operating device has built-up, and

providing a length-measuring instrument and electrical means and continuously monitoring the total path of the clamping cylinder by continuously sending electrical signals corresponding to all respective positions of the clamping cylinder from said length-measuring instrument to said control device and providing means for and comparing the respective positions with said working range when operatively connecting the operating device and the workpiece, and

providing a blocking means and blocking the drive effecting the machining of the workpiece by the control device when the clamping cylinder is outside of said working range.

5. In an apparatus for determining and monitoring the working range of a double-acting clamping cylinder having a displaceable clamping cylinder piston for actuation of a respective operating device from time to time, the operating device comprising a supporting device, a centering device or a clamping device, respectively, on a machine tool, the apparatus having an actuating rod releasably connecting the clamping cylinder piston with the operating device, a monitoring means for detecting positions of said clamping cylinder piston of said clamping cylinder, said monitoring means operatively being connected with the clamping cylinder piston, the monitoring means sending electrical signals to a control means, the latter being connected with the monitoring means and for controlling drives for effecting the machining of workpieces adapted to be used with the operating device, the monitoring means establishing a working range of the clamping cylinder piston for the operating device, the working range defining an operating range of the clamping cylinder piston in connection with the operating device within a larger total path of stroke of the clamping cylinder piston, the control means blocking the drives for effecting the machining of the workpieces when the clamping cylinder piston is outside of the operating range, the improvement wherein

said monitoring means comprises a length-measuring means for monitoring the total path of the clamping cylinder piston continuously sending electrical signals to the control means as a function of the respective position of the clamping cylinder piston, and

said control means includes memory means for storing end positions of a total stroke, the latter being a first respective idle stroke of the clamping cylinder piston when operatively connected with the respective operating device without the workpieces, said end positions being respectively within the total path of the clamping cylinder piston and being detected by said length-measuring means and sent via the latter via respective of said electrical signals to said control means, and

said control means includes means for subtracting respective post-tightening strokes associated with the respective operating device from said end positions respectively so as to determine and for storing the respective working range with the respective operating device of the clamping cylinder piston, said post-tightening strokes associated with the respective operating device being predetermined distances so as to guarantee that a sufficient holding of the workpieces by the respective operating device has built-up, and

said control means includes means for comparing said electrical signals representative of the respective position at each time of said clamping cylinder piston with said respective working range when operatively connected with the respective operating device with the workpieces and means for blocking the drives for effecting the machining

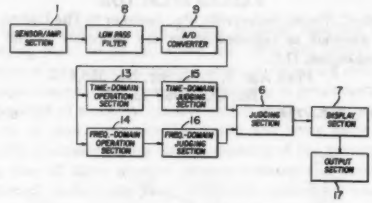
of the workpieces when the clamping cylinder piston is outside of the respective working range.

4,493,042

BEARING FAILURE JUDGING APPARATUS

Ichiji Shima; Hiroshi Teshima, both of Kansai Electric Power Company Incorporated, Sohgo Gijyutsu Kenkyusho, No. 1, Nakohji Ichinotsubo, Amagasaki-shi, Hyogo-Ken, Japan; Takayuki Koizumi, and Teruo Usami, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo; Ichiji Shima and Hiroshi Teshima, both of Amagasaki, all of, Japan

Continuation-in-part of Ser. No. 119,201, Feb. 7, 1980, abandoned. This application Feb. 19, 1982, Ser. No. 350,249
Claims priority, application Japan, Apr. 16, 1979, 54-46427
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—507 **6 Claims**



1. A bearing failure judging apparatus comprising:
sensing means for sensing a signal produced from a bearing and producing a sensed signal output;
time domain extracting means for extracting features in the time domain of said sensed signal output from said sensing means and producing an output signal;
frequency domain extracting means for extracting features in the frequency domain of said sensed signal output and producing an output signal; and
judging means for judging the type of a failure occurring in the bearing on the basis of said output signal from said time domain extracting means and said output signal from said frequency domain extracting means,
wherein said judging means determines the type of failure to be scars when a repetitive period of pulsate waves appearing in said sensed signal output in the time domain is fixed, when there is a localization in the amplitudes of the pulsate waves, and when a frequency peak perculiar to the bearing member appears in the spectrum in the frequency domain of said sensed signal output.

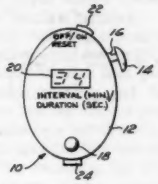
4,493,043

MEDICAL TIMING SYSTEM FOR USE DURING PREGNANCY AND METHOD OF USING SAME

Frank P. Forbath, 2880 Club House Rd., Costa Mesa, Calif. 92626

Filed Nov. 25, 1981, Ser. No. 325,037
Int. Cl.³ G06F *15/20*; G04F *7/06*
U.S. Cl. 364—569 **20 Claims**

1. A labor contraction duration and interval timer comprising:
a timing circuit that produces a timing signal;
an electrical input device having a first state and a second state;
a processor connected to said timing circuit and to said electrical input device, wherein:
said processor samples said timing signal when said input device is changed from the first state to the second state at the beginning of a contraction, and again samples said timing signal when said input device is changed from the second to the first state at the end of a contraction, and said processor automatically determines the length of time between the most recent input device state changes after the input device is changed from the second state to the first state, which time is the length of the measured contraction; and
said processor additionally automatically determines the length of time between the two most recent changes of the input device from the first state to the second state,



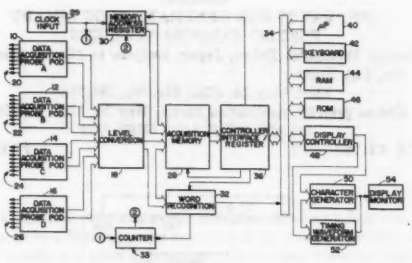
after the input device is changed from the first state to the second state, which time is the length of time between the beginning of one measured contraction and the beginning of the next measured contraction, or contraction interval; and
a device for reading out the determined contraction length and contraction interval data.

4,493,044

APPARATUS AND A METHOD OF ESTABLISHING THE CORRECT DISPLAY ORDER OF PROBE CHANNELS FOR A LOGIC ANALYZER

Hoeren Gerd H., Lake Oswego, and Steven R. Palmquist, Beaverton, both of Oreg., assignors to Tektronix, Beaverton, Oreg.

Filed Mar. 8, 1982, Ser. No. 355,968
Int. Cl.³ G05B *23/02*; G01R *29/02*
U.S. Cl. 364—579 **10 Claims**



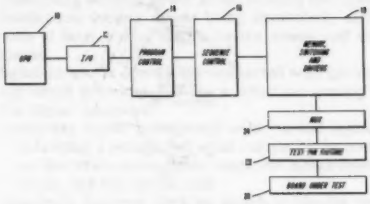
1. A method of establishing the correct order of probe channels of a logic analyzer, said logic analyzer indentifying each of said probe channels by providing a plurality of channel identifiers, said logic analyzer having connected thereto at least one probe pod, said pod having a plurality of probe tips extending therefrom for connection to a corresponding plurality of terminals of a product under test, each of said probe tips corresponding to one of said channel indentifiers, comprising the steps of:
connecting said probe tips to said terminals of said product under test;
determining the actual order of connection of said probe tips to said terminals of said product under test thereby determining a desired order of connection of said probe tips to said terminals; and
changing the order of individual channel identifiers to reflect said desired order of connection of said probe tips to said terminals.

4,493,045

TEST VECTOR INDEXING METHOD AND APPARATUS

John H. Hughes, Jr., Cohoes, N.Y., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Oct. 19, 1981, Ser. No. 312,839
Int. Cl.³ G05B 19/02, 23/02
U.S. Cl. 364—580 11 Claims



1. A system for generating a sequence of test vectors, comprising:

a first memory for storing a first set of test vectors and a second set of test vectors representing variables to be inserted in said first set of test vectors;

a second memory for storing test pattern instructions;

a test pattern controller responsive to the instructions stored in said second memory for addressing said first memory to access a test vector from said first set;

a vector data controller responsive to the instructions stored in said second memory for addressing said first memory to access a test vector from said second set; and

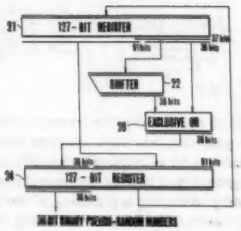
switching means for selectively applying address signals from said test pattern controller or said vector data controller to said first memory in accordance with instructions from said second memory.

4,493,046

APPARATUS FOR GENERATION OF BINARY PSEUDO-RANDOM NUMBERS

Tadashi Watanabe, Tokyo, Japan, assignor to Nippon Electric Co., Ltd, Japan

Filed May 24, 1982, Ser. No. 381,714
Claims priority, application Japan, May 26, 1981, 56-79518
Int. Cl.³ H03K 3/84; G06F 7/38
U.S. Cl. 364—717 2 Claims



1. Apparatus for generation of binary pseudo-random numbers of n bits by use of the maximum-length shift register sequence based on a primitive polynomial, $f(x)=x^p+x^q+1$, where p and q are positive integers satisfying the relation $p>q\geqq 1$, said apparatus comprising:

p-bit storage means;

(p−q) bit shift means for shifting the lowermost (p−q+m) bits of said p-bit storage means;

exclusive OR means for exclusive-ORing bit by bit the lowermost m ($m\leqq n$) bits of said p-bit storage means and m bits resulting from said shifting; and

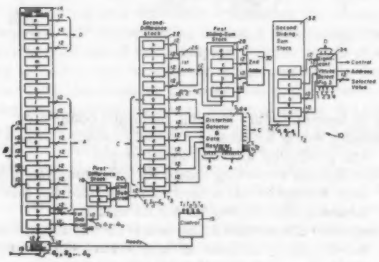
means for restoring the uppermost (p−m) bits of said p-bit storage means to the lowermost (p−m) bits of said p-bit storage means and exclusive-Ored results to the uppermost m bits of said p-bit storage means and for extracting the uppermost n bits of said p-bit storage means.

4,493,047

REAL TIME DATA SMOOTHER AND SIGNIFICANT VALUES SELECTOR

Mervin C. Werst, Sellersville, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 5, 1982, Ser. No. 365,816
Int. Cl.³ G06F 15/31
U.S. Cl. 364—724 6 Claims



1. An apparatus for distortion detection, data restoration and smoothing, and significant value selection for a discrete number of consecutive samples of real time digital data, comprising in combination:

first storage means formed to be connected to receive the samples for providing a first signal of consecutive first-differences of a plurality of the last received samples, a second signal (A) of a plurality of intermediate received samples, a third signal (D) of a plurality of the first received samples, and a ready signal indicative that said first storage means has received the samples;

second storage means connected to receive the first signal for providing a fourth signal of a plurality of last consecutive second-differences and a fifth signal of consecutive first-sliding-sums of a plurality of first consecutive second-differences;

restorer means connected to receive the second signal (A) and the fourth signal for providing to said first storage means a sixth signal (B) of a plurality of samples restored therein and strobe pulses, and to said second storage means a seventh signal (C) of a plurality of clear pulses;

third storage means connected to receive the fifth signal for providing an eighth signal of a plurality of consecutive second-sliding-sums;

selector means connected to receive the eighth signal and the third signal (D) for providing consecutive smoothed, restored samples; and

control means connected to receive the ready signal for providing control signals to control said first storage means, second storage means, restorer means, third storage means, and selector means.

4,493,048

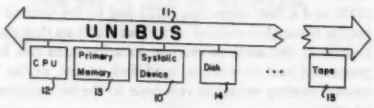
SYSTOLIC ARRAY APPARATUSES FOR MATRIX COMPUTATIONS

Hsiang-Tsung Kung, and Charles E. Leiserson, both of Pittsburgh, Pa., assignors to Carnegie-Mellon University, Pittsburgh, Pa.

Continuation of Ser. No. 352,701, Feb. 26, 1982, abandoned, which is a continuation of Ser. No. 968,451, Dec. 11, 1978, abandoned. This application May 16, 1983, Ser. No. 494,659

Int. Cl.³ G06F *7/38*

U.S. Cl. 364—754 **14 Claims**



1. In a computer system having external handling means delivering input to be processed and receiving output and a plurality of processors forming a network receiving said input, the improvement comprising said plurality of processors being independent of a central control which sends control instructions to all processors simultaneously and being made up of boundry processors lying on the boundry of the network and being one of inner product step processors and processors capable of performing usual arithmetic operations including division and internal processors within the area surrounded by said boundry processors and being inner product step processors, said processors being assembled in a network by nearest neighbor connections in which a regular flow of data is maintained, synchronizing means connected to each processor rythmically feeding data into and out of processors in said network and between said network and said external handling means and connections between at least one of the boundry processors and said external handling means whereby data is fed therebetween.

4,493,049

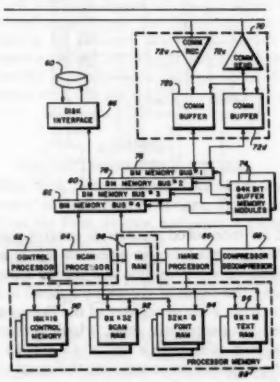
SHARED RESOURCE CLUSTERED PRINTING SYSTEM

James M. Donohue, Brighton, N.Y., and Andrew T. Ling, Rancho Palos Verdes, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 5, 1981, Ser. No. 270,949

Int. Cl.³ G06F *3/12*

U.S. Cl. 364—900 **7 Claims**



1. An apparatus for generating characters to be scanned in raster format from character input byte information including:

a character input device providing the input byte information,

a first memory for storing the character input byte information,

a character generator communicating with the first memory,

a buffer memory,

a buffer memory bus connected to the buffer memory and the memory storing the input byte information, and

an output marker, the output marker connected to the character generator, via the first memory,

the character generator including a control processor connected to the character input device for sorting the character input byte information, a scan processor interconnected to the buffer memory and the first memory through the memory bus, the control processor providing scan line lists from the byte information, the scan processor transforming the scan line lists into coded field streams and a compressor for receiving the coded field streams and providing an output marker scanning format in the first memory whereby character input byte information is converted into output marker scanning format and stored in the first memory for directly driving the output marker.

4,493,050

ELECTRONIC TRANSLATOR HAVING REMOVABLE VOICE DATA MEMORY CONNECTABLE TO ANY ONE OF TERMINALS

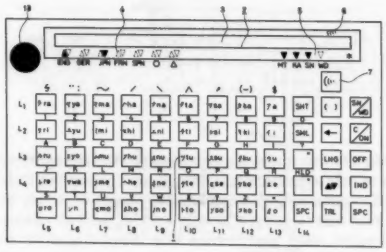
Shintaro Hashimoto, Ikoma; Masafumi Morimoto, Yamatokoriyama; Tosaku Nakanishi, Nara; Hideo Yoshida, Kashihara, and Shigenobu Yanagiuchi, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 24, 1981, Ser. No. 286,466

Claims priority, application Japan, Jul. 31, 1981, 55-106886

Int. Cl.³ G06F *15/38*

U.S. Cl. 364—900 **3 Claims**



1. An improved electronic translator wherein a first word or words in a first language are entered to obtain a second word or words in a second language that are the translated equivalent of the first word or words, the translator comprising

input means for entering the first word or words into the translator and for entering commands,

a permanently included first memory means for storing a plurality of words in the first language including the first word or words, the plurality of words being stored at respectively specific addresses,

second memory means for storing a like plurality of words in the second language including the second word or words, each of the plurality of words in the second memory means being stored at a specific address that is equivalent to the address of a corresponding word in the first memory means,

at least two connectors,

third memory means for storing voice data corresponding to the translated equivalents of at least some of the first word or words in another language, the third memory means being removably connected to the translator through one of the connectors,

first access means responsive to the input means for accessing the first memory means and the second memory means to retrieve the first word or words and the translated equivalent second word or words,

detection means responsive to the input means and the first access means for detecting which connector has the third memory means connected thereto, for detecting whether the voice data stored in the third memory means corresponds to second word or words in the second language, and for detecting whether the third memory means includes voice data equivalent to the second word or words,

indicator means responsive to the detection means for indicating whether voice data representing the second word or words in the second language is stored in the third memory means,

second access means responsive to the input means and the detection means for retrieving from the third memory means voice data representing the second word or words in the second language, and

voice generation means responsive to the second access means for producing an audible output of the second word or words by voice synthesization of the voice data.

4,493,051

COMMUNICATION LINE SCANNING DEVICE FOR A COMMUNICATION CONTROLLER

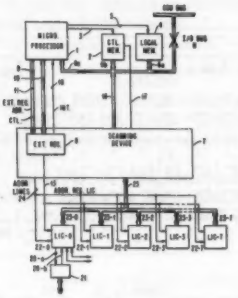
Bernard Brezzo, Nice; Jean Calvignac, LaGaude; Richard Dambricourt, Cagnes; Andre Masclet, and Jean-Pierre Sanche, both of Antibes, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 12, 1982, Ser. No. 433,609

Claims priority, application European Pat. Off., Oct. 28, 1981, 81430037.2

Int. Cl.³ G06F *3/04*

U.S. Cl. 364—900 **11 Claims**



1. A line scanning device (7) working under control of a microprocessor (1) connected to a control memory (2) in which a storage location area is assigned to each line, said scanning device and the microprocessor being included in a line adapter (LA) provided for a communication controller (CC) which receives or sends message bits in series from or to terminals (T) connected to the lines, characterized in that it includes:

an addressable first storing means (306) in which a storage location area is assigned to each line,

an addressable second storing means (314) in which a storage location area is assigned to each line,

a control and address means (303) comprising first and second address counters (501 and 502) under the control of an elementary time counter, the first counter outputting during elementary time t of a line scanning, the line address information of the first storing means and the second counter outputting during a time equal to elementary time n+, with n equal to 4 or above, the address information of the second storing means, and control means (500, 503, 505) receiving said address information and the elementary time information to provide on outputs (324, 352) of the control and address means, read/write control and address information on times selected during the scanning period and, sequentially, the addresses of the lines being scanned,

a first processing and monitoring logic circuit (308) comprising means (617, 614) for deserializing/serializing bits, for receiving or sending a message bit on each scanning period, this circuit being connected on the one hand, to a bit exchange line which carries the bit received or to be transmitted to the scanned line (348) and during the other hand, to the first storing means through a first read bus (310) and a first write bus (312) and to the second storing means through a second write bus (322) so that the information in the address storage location area can be read, processed and re-written, modified or not, in the first or second storing means in response to the bit received or to be sent,

a second processing and monitoring logic circuit (316) comprising means (723, 724, 714, 719, 726, 725) for assembling characters into half-words and disassembling half-words into characters, connected on the one hand, to the control memory on an address bus (17) and a data bus (16) and on the other hand, to the second storing means on a read bus (318) and a write bus (320) and to the first storing means on a second write bus (322) in order to exchange the messages to be transmitted in cycle steal mode between the control memory and the addressed areas of the first and second storing means.

4,493,052

METHOD AND ARRANGEMENT FOR THE MONITORED TRANSFER OF CONTROL SIGNALS AT INTERFACES OF DIGITAL SYSTEMS

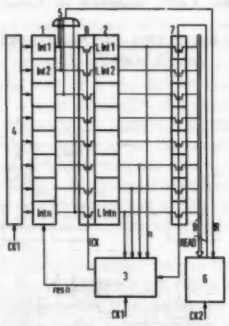
Gerhard Geiger, Schliersee, and Michael Strafner, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 15, 1982, Ser. No. 441,854

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1981, 3145632

Int. Cl.³ G06F *1/00*

U.S. Cl. 364—900 **8 Claims**



1. Method for monitored transfer of control signals at interfaces of digital systems wherein a request signal is transferred by a first system via a request line to a second system, information concerning the cause of the request signal is taken by the second system from a status register of the first system, and the status register is subsequently reset, which comprises providing the first system with both a first and a second status register; storing the information concerning the cause of the request signal in the first status register which has outputs connected to respective inputs of the second status register; connecting the second status register to the second system when a read signal

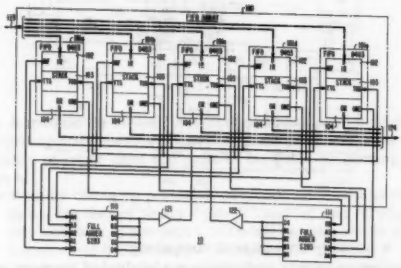
delivered by the second system is present; severing the connection between the first and the second status registers during the presence of the read signal and a subsequent clock cycle of the first system; monitoring by the second system of a readout of the second status register; and resetting respecive cells of the first status register after the second status register is read out.

4,493,053

MULTI-DEVICE APPARATUS SYNCHRONIZED TO THE SLOWEST DEVICE

Dennis J. Thompson, Geneva, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 10, 1982, Ser. No. 448,824
Int. Cl.³ G06F 1/00
U.S. Cl. 364—900 **13 Claims**



1. A synchronous apparatus comprising:

a plurality of devices for operating synchronously, each device having an output terminal for selectively generating thereon a first signal to indicate readiness to operate and a second signal to indicate completion of operation, each device further having an input terminal for receiving thereon a third signal for causing the device to operate and a fourth signal for causing the device to stop operating; and

synchronizing means, having a plurality of input terminal means connected to the output terminals of the plurality of devices and output terminal means connected to the input terminals of the plurality of devices, adapted to initiate generating on its output terminal means the third signal upon sensing the first signal on all of its input terminal means and to continue to generate the third signal while the first signal is present on at least one of its input terminal means, the means further adapted to initiate generating on its output terminal means the fourth signal upon sensing the second signal on all of its input terminal means and for continuing to generate the fourth signal while the second signal is present on at least one of its input terminal means, thereby to synchronize the operation of the plurality of devices with the slowest of the plurality of devices.

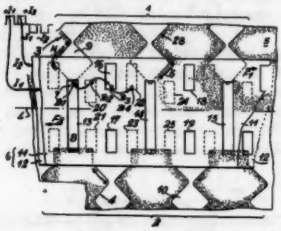
4,493,054

MAGNETIC BUBBLE STORE

Mokhtar Boshra-Riad, Giza, Egypt; Jean-Marc Fedeli, Saint Egreve, France; Hubert Jouve, Biviers, France, and Daniel Mauduit, Rives sur Fure, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 7, 1981, Ser. No. 251,759
Claims priority, application France, Apr. 18, 1980, 80 08764
Int. Cl.³ G11C 19/08
U.S. Cl. 365—36 **5 Claims**

1. A magnetic bubble store comprising at least a first and second series of longitudinally oriented minor shift registers and means for producing a displacement of the bubbles in said registers, said first series of minor registers being disposed on one side of a transverse boundary and said second series of minor registers being disposed on the other side of said transverse boundary with said transverse boundary being constituted by a major register, wherein the minor registers of each of said first and second series are constituted by motifs defined



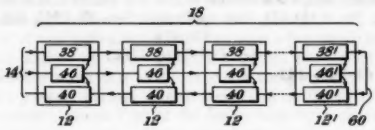
by ion implantation in a magnetic garnet layer, said motifs defining respectively on said one side and said other side of said boundary, complementary distributions of implanted areas and non-implanted areas.

4,493,055

WAFER-SCALE INTEGRATED CIRCUITS

Ismet M. F. M. Osman, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 14, 1981, Ser. No. 330,539
Claims priority, application United Kingdom, Dec. 12, 1980, 8039902
Int. Cl.³ G11C 7/00, 19/00
U.S. Cl. 365—78 **22 Claims**



1. An integrated circuit comprising a data port and a plurality of data processing cells on a semiconducting wafer, at least some of said cells being connectable to neighbouring cells for data transfer to form a chain of cells starting at said port, the transfer of data between said cells in said chain being controlled by a clock signal and wherein each of said cells in said chain includes clock signal propagation means for propagating said clock signal from cell to cell along said chain.

4,493,056

RAM UTILIZING OFFSET CONTACT REGIONS FOR INCREASED STORAGE CAPACITANCE

Robert S. Mao, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1982, Ser. No. 394,055
Int. Cl.³ G11C 11/24, 11/40
U.S. Cl. 365—149 **6 Claims**

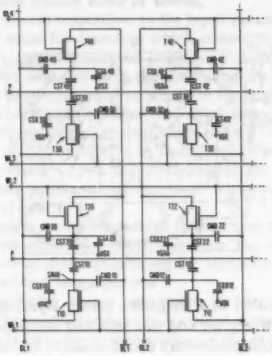
1. A memory cell comprising:

a transfer device having a control electrode and an offset contact region, the control electrode being electrically connected to a word line, the contact region being electrically connected to a first bit line;

a storage capacitance operatively connectable to said first bit line by selective actuation of the control electrode of said transfer device; and

a second bit line spaced apart from said first bit line and

capacitively coupled to said storage capacitance, wherein said second bit line substantially overlies said storage



capacitance and said control electrode, and said first bit line substantially overlies said contact region.

4,493,057

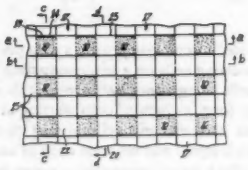
METHOD OF MAKING HIGH DENSITY SEMICONDUCTOR DEVICE SUCH AS FLOATING GATE ELECTRICALLY PROGRAMMABLE ROM OR THE LIKE

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 110,052, Jan. 7, 1980, , which is a continuation-in-part of Ser. No. 923,876, Jul. 12, 1978, Pat. No. 4,184,207, which is a division of Ser. No. 762,613, Jan. 26, 1977, Pat. No. 4,151,021. This application Sep. 27, 1982, Ser. No. 424,124

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—182 14 Claims



1. A floating gate type semiconductor memory array comprising: a plurality of MOS transistor devices each having a source, a drain, a floating gate, and a control gate, the floating gate being isolated from the channel between source and drain by thin insulator and the control gate being isolated from the floating gate by thin insulator, the transistor devices being arranged in an array of rows and columns, with the columns of transistor devices being separated by elongated parallel heavily-doped regions in the semiconductor which define column lines; means connecting the control gates of all device in each row together to provide row lines; said elongated parallel heavily-doped semiconductor regions forming the source and drain regions of the transistor devices as well as connecting the sources and drains of all adjacent devices together to provide said column lines, one pair of opposite parallel edges of the floating gate in each transistor device being aligned with edges of the control gates of all transistor devices in each row, and the other pair of opposite parallel edges of the floating gate in each transistor device being aligned with edges of the elongated parallel heavily-doped regions.

4,493,058

INTEGRATED CIRCUIT FOR WRITING, READING AND ERASING MEMORY MATRICES WITH INSULATED-GATE FIELD-EFFECT TRANSISTORS HAVING NON-VOLATILE STORAGE BEHAVIOUR

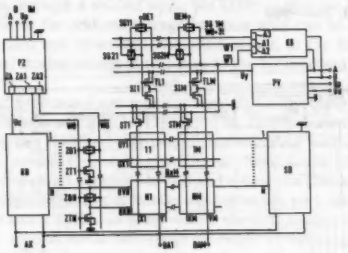
Fritz G. Adam, Freiburg, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Mar. 18, 1982, Ser. No. 359,536

Claims priority, application European Pat. Off., Apr. 1, 1981, 81102460.3

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—189 10 Claims



1. A memory arrangement comprising:

a memory matrix comprising a plurality of memory cells each connected to one of a first plurality of row selection lines and to one of a first plurality of column selection lines, each cell comprising insulated gate field effect transistors having a nonvolatile storage behavior; and

an integrated circuit formed in a semiconductor body for programming said memory matrix, said circuit comprising:

a first decoder having a first plurality of address inputs and a first plurality of outputs, each of said first plurality of outputs being coupled to a corresponding one of said first plurality of row selection lines, said first decoder being responsive to address signals at said first plurality of address inputs for establishing conductive paths from all of said first plurality of outputs to a first potential input except for a selected one of said first plurality of outputs and for causing the path from said selected one of said first plurality of outputs to said first potential input to be nonconductive, said first decoder comprising insulated gate field effect transistors of a first conductivity type arranged in said semiconductor body, said first potential input and said semiconductor body being coupled to a first potential;

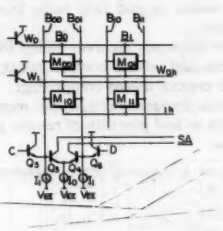
a second decoder having a second plurality of address inputs and a second plurality of outputs, each of said second plurality of outputs being coupled to one of said first plurality of outputs by the corresponding one of said row selection lines, each of said second plurality of address inputs being coupled to a corresponding one of said first address inputs, said second decoder being responsive to said address signals for establishing a conductive path from a selected one of said second plurality of outputs to a second potential input and for causing the paths from the remaining ones of said second plurality of outputs to said second potential input to be nonconductive, said second decoder comprising insulated gate field effect transistors of a second conductivity type arranged within an insulating island of said first conductivity type in said substrate, said second potential input being coupled to said insulating island; and

a row potential selection circuit having a potential output coupled to said second potential input.

4,493,059
CIRCUIT AND METHOD FOR WRITING IN A SEMICONDUCTOR MEMORY DEVICE

Hideaki Isogai, Higashikurume, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 27, 1982, Ser. No. 343,163
Claims priority, application Japan, Jan. 29, 1981, 56-11973
Int. Cl.³ G11C 7/00, 11/40
U.S. Cl. 365—190 8 Claims



1. A method for writing in a semiconductor memory device comprising static memory cells connected at intersections of a plurality of word lines and pairs of bit lines, comprising the steps of:

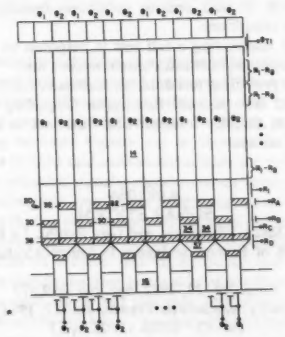
writing by changing potentials of paired bit lines according to writing data of binary digits "1" and "0" and turning on one transistor of a memory cell while turning off the other transistor of the memory cell; and

maintaining one of the paired bit lines at a low level while the other bit line is simultaneously maintained at a high level, where the period of maintenance of the high level is shorter than the period of maintenance of the low level.

4,493,060
SERIAL-PARALLEL-SERIAL CHARGED COUPLED DEVICE MEMORY AND A METHOD OF TRANSFERRING CHARGE THEREIN

Ramesh C. Varshney, San Jose, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Continuation of Ser. No. 241,780, Mar. 9, 1981, abandoned. This application Oct. 20, 1983, Ser. No. 543,228
Int. Cl.³ G11C 11/34
U.S. Cl. 365—238 2 Claims



1. An interface gate structure for transferring charge from the parallel to serial registers of a charge coupled device having at least first and second parallel charge transfer registers and a serial charge transfer output register comprising:

a first transfer gate (30) for coupling charge out of said first parallel register in response to a first signal (R_B) at a first time;

a second transfer gate (32) for coupling charge out of said second parallel register in response to a second output signal (R_A) at a second time;

a first storage gate (34) for receiving and storing charge transferred by said first (30) and said second (32) transfer gates from said first and second parallel registers;

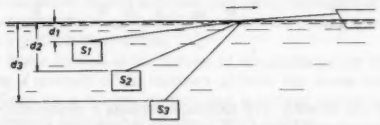
a second storage gate (37) for storing charge transferred from said first storage gate (34);

a third transfer gate (36) for transferring charge between said first storage gate (34) and said second storage gate (37) in response to a third signal (R_D) wherein said first transfer gate (30) and said second transfer gate (32) are offset to prevent concurrent charge transfer from said parallel registers into said first storage gate (34).

4,493,061
STACKED MARINE SEISMIC SOURCE

Clifford H. Ray, Houston, Tex., assignor to Fairfield Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 291,269, Aug. 10, 1981, Pat. No. 4,441,174. This application May 21, 1982, Ser. No. 380,569
Int. Cl.³ G01V 1/36, 1/38
U.S. Cl. 367—23 7 Claims



1. A marine seismic wave source, including a plurality of individual gas expansible sources, each of said sources producing a primary shock wave into the water from the location where said source is positioned, each of said sources also producing an after-shock wave into the water a predetermined time after said primary shock wave, comprising;

a first of said individual sources towed at a first depth below the surface of the water, the negative portion of said primary wave from said first source being separated from the positive portion thereof dependent on the round-trip acoustical travel time of the source impulse to the water surface, the positive portion of the after shock wave therefrom occurring at a time after the primary shock wave dependent on the pressure of the water at said first depth, the negative portion of said after shock wave being separated from its positive portion by the same time separation that the negative portion of the primary wave is separated from its positive portion,

a second of said individual sources towed ahead of said first individual source at a second depth below the surface of the water greater than said first depth, the negative portion of said primary wave from said second source being separated from the positive portion thereof dependent on the round-trip acoustical travel time of the source impulse to the water surface, the positive portion of the after-shock wave therefrom occurring at a time after the primary shock wave dependent on the pressure of the water at said second depth, the negative portion of said after-shock wave being separated from its positive portion by the same time separation that the negative portion of the primary wave is separated from its positive portion,

the round-trip time for said second source being longer than the round-trip time for said first source, the pressure for said second source being greater than the pressure for said first source, thereby causing the relative time of arrival of said after shock for said second source to be shorter than for said first source,

said positive portions of the primary waves from said first and second sources occurring substantially simultaneously at a location below said second source before the negative portion of the primary wave from said first source occurs at said location, which is then followed by the negative

portion of the primary wave from said second source at said location, said primary and negative portions of said first source and second source after-shock waves occurring at respectively different times at said location,

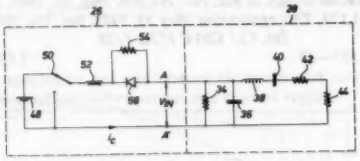
whereby, said positive portions of said primary shock wave energy accumulates and said negative portions of said primary shock wave energy and said positive and negative portions of said after-shock wave energy do not accumulate.

4,493,062

RESONANT FREQUENCY MODIFICATION OF PIEZOELECTRIC TRANSDUCERS

A. J. Mallett, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 12, 1983, Ser. No. 560,673
Int. Cl.³ G01V 1/40
U.S. Cl. 367—32 3 Claims



1. An acoustic well tool incorporating a piezoelectric transmitter crystal having a diameter mode resonant frequency said transmitter being operated in a pulsed mode at an output frequency of operation below said diameter mode resonant frequency of said crystal, comprising:

(a) a piezoelectric crystal for generating acoustic pulses for propagation into the earth formations adjacent to a borehole; and

(b) a crystal loading circuit connected to said crystal and including a series inductor means, a series blocking diode connected to permit current flow in one direction through said inductor means and said crystal and to limit current flow in the other direction, and wherein said inductor means is connected to a voltage source, and switch means timed in operation to selectively connect said inductor means with said crystal to define a tank circuit having a capacitive component attributable to said crystal and an inductive component from said inductor means wherein the resonant frequency of the tank circuit is less than said diameter resonant frequency of the crystal and to disconnect said inductor means from said voltage source.

4,493,063

METHOD AND APPARATUS FOR SEISMIC GEOPHYSICAL EXPLORATION

Harold A. Tims, Bartlesville, Okla.; Sheldon E. Elliott, London, England; Orin C. Montgomery, and William N. Doggett, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 30, 1978, Ser. No. 955,745
Int. Cl.³ G01V 1/16
U.S. Cl. 367—77 40 Claims

1. A seismic system for geophysical exploration comprising:

a plurality of remote geophone monitoring means, each of said remote geophone monitoring means being adapted to receive electrical signals from at least one geophone means; and

a central control means for generating electrical signals for initiating the operation of said plurality of remote geophone monitoring means;

each of said plurality of remote geophone monitoring means comprising:

means for sampling electrical signals, provided from at least one geophone means, and for converting the sampled electrical signals into digital seismic data;

a first data storage means;

means for providing said digital seismic data to said first data storage means to therein store said digital seismic data;

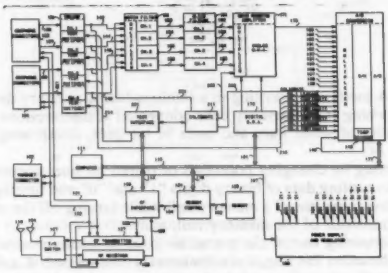
a first radio frequency transmitter means for transmitting said digital seismic data to said central control means in response to a transmit command from said central control means;

means for providing said digital seismic data from said first storage means to said first radio frequency transmitter means; and

a first radio frequency receiver means for receiving a command from said central control means;

said central control means comprising:

a second radio frequency transmitter means for transmitting commands to said plurality of remote geophone monitoring means;



a second radio frequency receiver means for receiving digital seismic data from said plurality of remote geophone monitoring means;

error detection means;

means for providing digital seismic data from said second radio frequency receiver means to said error detection means;

a second data storage means; and

means for providing digital seismic data from said error detection means to said second data storage means to therein store the digital seismic data provided from said error detection means,

wherein each of said remote geophone monitoring means additionally comprises:

means for conducting a self test in response to a test command from said central control means; and

means for providing test data, representative of the results of said self test, to said first radio frequency transmitter means to thereby transmit said test data to said central control means.

4,493,064

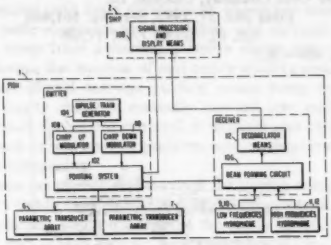
SONAR SYSTEM

Dominique Odero, Vincennes, and Guy Parent, Le Plessis Robinson, both of France, assignors to Sintra-Alcatel, Asnieres, France

Filed Jul. 19, 1982, Ser. No. 399,577
Claims priority, application France, Jul. 17, 1981, 81 13961
Int. Cl.³ G01S 15/02, 7/52
U.S. Cl. 367—92 9 Claims

1. A sonar system, comprising: a vehicle capable of moving over the bottom of an extent of water; an emitter of acoustic pulses and a receiver of acoustic energy mounted on said vehicle, said emitter of acoustic pulses comprising at least two parametric transducer arrays each generating a scanning beam having a spot radiation pattern and steerable in a plurality of directions for forming a plurality of channels, said two transducer arrays being disposed laterally, one on each side of said

vehicle, and coupled channel-by-channel in an arrangement providing two diverging pointing directions at all times; and an



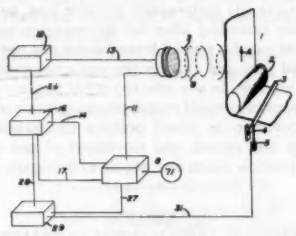
electronic pointing system for selecting and scanning through said channels.

4,493,065

WEB POSITION INDICATOR

Edward L. Sword, Jr., 2912 Chimney Rock La., Louisville, Ky.

Filed May 24, 1982, Ser. No. 381,916
Int. Cl.³ G01S *15/88*
U.S. Cl. 367—96 **8 Claims**



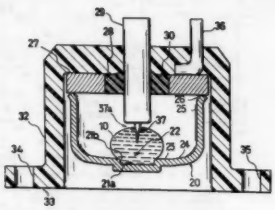
1. Apparatus for detection of a planar web within a selected space between first and second distances from a sonic signal generator where said sonic generator generates regularly repetitive ultra sonic signals of selected frequency, duration, and time spacing between signals and is disposed to direct said sonic signals toward said web so the signals are reflected from said web as reflected signals; signal receiver means to receive said reflected signals, time signal generating means to generate signal pulses during the time period between the generation of said ultra sonic signal and receipt of said reflected signals; counter means to receive said signal pulses and count said signal pulses during the time interval between the transmission of said ultra sonic signal and said reflected signal and provide said counted pulses as a binary number signal at counter output means indicative of the distance of said web from said signal generator; binary to decimal converter means having binary coded decimal number input and decimal outputs to receive said binary number signal and provide a decimal output; switch means provided at at least one of said decimal outputs to be selectively opened or closed to permit transmission of signals provided at said decimal output so the presence of said web within said selected space from said generator is reflected by signals at selected decimal outputs.

4,493,066

SEISMOSENSITIVE DEVICE

Susumu Ubukata, and Yasukazu Mizutani, both of Nagoya, Japan, assignors to Susumu Ubukata, Nagoya, Japan

Filed Aug. 25, 1983, Ser. No. 526,498
Claims priority, application Japan, Jun. 10, 1983, 58-104576
Int. Cl.³ H01H *29/00*
U.S. Cl. 367—178 **8 Claims**



1. A seismosensitive device comprising;

(a) an enclosure having a bottom and being fabricated of an electro-conductive material, the enclosure sealing a mercury globule therewithin;

(b) a recess formed at the bottom of the enclosure for bedding a quantity of the mercury globule, the recess being defined by a bottom portion and a vertical uprise wall extending upwardly from the bottom portion,

(c) the enclosure bottom comprising a first annular low gradient surface extending outwardly from the side of the recess, the first annular surface being defined by a relatively small gradient, and

a second annular high gradient surface extending from and surrounding the external side of the first annular surface, the gradient of the second annular surface being larger than the gradient of the first annular surface to return the mercury globule into the recess;

(d) a first electrode means mounted in electrically insulated relation on the enclosure to contact the mercury globule and a second electrode electrically conductively connected to the enclosure;

(e) a shaped contact supported within the enclosure by the first electrode means, the contact projecting into the the mercury globule when the mercury globule is bedded in the recess;

whereby the mercury globule will tend to remain within the recess in the state of a coaxial alignment with the center of the recess.

4,493,067

SEISMIC VIBRATOR CONTROL SYSTEM

Bobby J. Thomas, and Billy J. Heath, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Apr. 13, 1981, Ser. No. 253,207
Int. Cl.³ G01V *1/155, 1/143*
U.S. Cl. 367—189 **12 Claims**

4. Apparatus for constructing a seismic vibrator control signal, comprising:

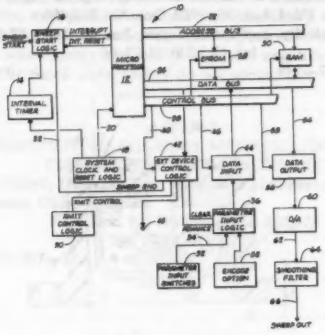
means for storing a selected plurality of digital amplitude and binary parameter signals in addressable location;

input switch means providing binary coded decimal input of parameters relating to starting frequency, ending frequency, sweep time and sweep taper time of said control signal;

means for converting said binary coded decimal inputs to said binary parameter signals for input to said means for storing;

microprocessor means accessible to said means for storing and energizable to enable output of digital amplitude values in sequence controlled by said binary parameter

signals and in the form of a digital control signal of selected frequency and duration; and



second means for converting said digital control signal to an analog control signal for energization of a seismic vibrator.

4,493,068

PICK-UP POINT DISLOCATION DETECTING DEVICE IN RECORDING A DISC PLAYER

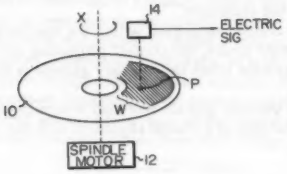
Ryuichi Naito, and Hiroyuki Hirano, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 14, 1982, Ser. No. 398,218

Claims priority, application Japan, Jul. 15, 1981, 56-105247[U]

Int. Cl.³ G11B *21/10*; H04N *5/76*

U.S. Cl. 369—44 **9 Claims**



1. A detection device for detecting dislocation of a pick-up point of pick-up means incorporated in a disc player from a recorded region of a recording disc being played back in the disc player, said recording disc carrying on the recording surface thereof a track signal in the form of one or more circumferentially extending tracks which define said recording region, said pick-up means being positioned in the proximity of said recording surface of said recording disc for producing an electric signal containing said track signal while aligning said pick-up point onto a target track under the tracking servo control of said disc player, which comprises:

comparing means for comparing the intensity of said electric signal with a first reference level and for producing an output signal when the intensity of said electric signal falls below said first reference level; and

timer means for producing a dislocation signal when said output signal lasts longer than a first predetermined time period, said dislocation signal indicating dislocation of said pick-up point from said recorded region.

4,493,069

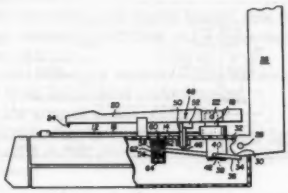
PHONOGRAPH

Gene L. Insley, East Aurora; Duane M. Seaburg, Oakfield, and Daniel S. Pearce, Buffalo, all of N.Y., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Jan. 27, 1983, Ser. No. 461,460

Int. Cl.³ G11B *1/04, 17/06*

U.S. Cl. 369—75.1 **7 Claims**



1. A phonograph having a rotatably mounted turntable for supporting a record comprising:

a tone arm assembly pivotally mounted on a spindle and having a needle at one end movable (1) into and out of engagement with a record upon pivotal movement of said tone arm assembly in a vertical plane, and (2) radially of the record across a record playing portion upon rotation of said tone arm assembly through a predetermined angle in a horizontal plane;

a hinged cover for the phonograph movable between open and closed positions; and

means coupling said cover to a portion of said tone arm assembly comprised of

a cam coaxial with said cover hinge, a lifter member having (1) a vertically reciprocally movable post, and (2) a horizontally extending lifter bar for engaging said tone arm assembly, and a pivotal lever having one end engageable by said cam and an opposite end engageable with said post, whereby in any selected radial position of said tone arm assembly on said record playing portion movement to said cover to its closed position causes said needle to engage said record, and movement of said cover to its open position causes said needle to disengage said record.

4,493,070

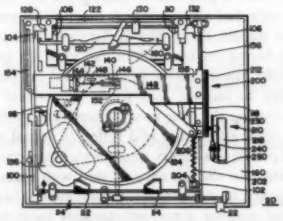
VIDEO DISC PLAYER HAVING CARRIAGE DRIVE MECHANISM

William A. Dischert, Jobstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 7, 1984, Ser. No. 607,880

Int. Cl.³ G11B *17/06, 21/04*

U.S. Cl. 369—77.2 **8 Claims**



1. A player for use with a record caddy; said player including a housing having an input slot into which an occupied record caddy is manually inserted in a first direction along a caddy insertion path for loading an enclosed record therein and into which an empty caddy is manually inserted for re-

trieving a loaded record therefrom; means for guiding caddy insertion into said housing along said caddy insertion path; a signal pickup for recovering prerecorded information from a rotatably-supported record during playback; a carriage for supporting said signal pickup; means for guiding said carriage along a second path lying substantially parallel to said caddy insertion path; apparatus for translating said carriage during playback away from a starting position along said carriage guiding means; the location of said caddy guiding means relative to that of said carriage guiding means being such that when an empty caddy is manually inserted into said player after playback for record retrieval, it engages said carriage to drive it back to said starting position; said carriage translating apparatus comprising:

(A) means coupled to said carriage for storing energy as an empty caddy engages said carriage to drive it back toward said starting position thereof in the caddy insertion direction; said energy storing means applying a force to said carriage in a sense urging its travel away from said starting position in a direction opposite to said caddy insertion direction; and

(B) a selectively-actuated speed control means coupled to said carriage for controlling the rate of movement of said carriage during playback as said energy storing means drives said carriage in said opposite direction away from said starting position; said selectively-actuated speed control means allowing an empty caddy to drive said carriage back to said starting position; said control means preventing said energy storing means from driving said carriage away from said starting position until said actuation thereof.

4,493,071

PICKUP CARTRIDGE

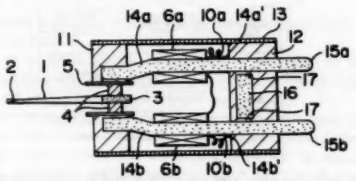
Yoshihisa Mori, Tokyo; Hachisiro Kobayashi, Machida, and Mitsuru Takashima, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 23, 1982, Ser. No. 351,427

Claims priority, application Japan, Mar. 18, 1981, 56-37744[U]

Int. Cl.³ H04R 11/12

U.S. Cl. 369—146 **7 Claims**



1. A pickup cartridge comprising:

pole pieces formed of magnetically and electrically conductive material;

a magnetic yoke cooperating with said pole pieces to form a magnetic flux path therewith and being electrically isolated from said pole pieces;

coils on said pole pieces, respectively, for producing an electrical signal in response to a varying magnetic flux in said pole pieces, said coils being electrically connected with said pole pieces, respectively;

means extending adjacent portions of said pole pieces for varying a magnetic flux in said pole pieces in accordance with information recorded on a record medium; and

output means extending from and electrically connected with other portions of said pole pieces for feeding said electrical signal from the cartridge through an electrical circuit which includes said pole pieces.

4,493,072

TURNTABLE DEVICE HAVING ROTARY RECORDING MEDIUM SIZE CHANGEOVER CAPABILITY IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

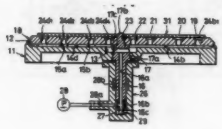
Norio Shibata, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 3, 1981, Ser. No. 269,896

Claims priority, application Japan, Jun. 3, 1980, 55-76861[U]

Int. Cl.³ G11B 3/62

U.S. Cl. 369—271 **7 Claims**



1. A turntable device having rotary recording medium size changeover capability in a rotary recording medium reproducing apparatus, said turntable device comprising:

a turntable adapted to be driven in rotation, said turntable having an upper surface, a turntable sheet carried on said upper surface of said turntable,

said turntable sheet having an upper surface for carrying and supporting a rotary recording medium thereon for unitary rotation therewith:

a spindle for said turntable;

air suction means; and

communicating structure means for providing communication between said air suction means and enclosed spaces formed between said turntable sheet and said rotary recording medium;

said turntable sheet having holes provided at positions along different radial directions thereof according to different sizes of said rotary recording medium, said holes extending through said turntable sheet, and a plurality of suction grooves of predetermined patterns communicating with said holes, said turntable sheet being angularly adjustable to different angular positions on said turntable according to the size of said rotary recording medium,

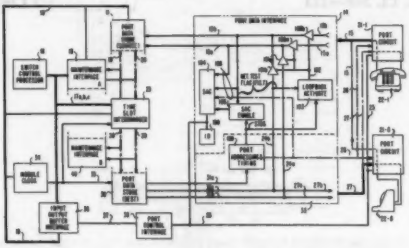
said turntable having grooves of a pattern communicating with the holes of said turntable sheet at positions according to the size of said rotary recording medium, in accordance with different angular positions of said turntable sheet carried on the upper surface of said turntable according to the size of said rotary recording medium;

the arrangement of the grooves in the turntable and the holes in the turntable sheet being such that the angular adjustment of the turntable sheet as a unit will place the entire turntable sheet in a plurality of selected positions each of which corresponds to a particular diameter of recording medium and establishes selective communication between the holes in the sheet and the grooves in the turntable to provide suction at the upper surface of the turntable sheet over a diametral extent corresponding to the particular diameter of the recording medium.

4,493,073
MAINTENANCE OF STORED PROGRAM CONTROLLED SWITCHING SYSTEMS

Ronald K. Witmore, Lafayette, and Jerome J. Zelenski, Broomfield, both of Colo., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 30, 1982, Ser. No. 413,156
Int. Cl.³ H04J 3/14
U.S. Cl. 370—14 **13 Claims**



1. A switching system adapted to establish time division connections among a plurality of port circuits via individual time slot paths, comprising:

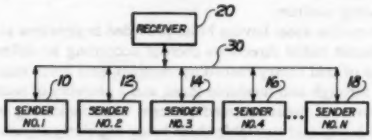
means for transporting a test vector along a selected one of said time slot paths, and

a plurality of signature analysis means disposed along said selected path, each of said signature analysis means being operative for providing a signature analysis of said test vector, whereby the location of a fault along said selected path can be determined by comparing each provided signature analysis with an expected signature analysis.

4,493,074
CONTENT INDUCED TRANSACTION OVERLAP COMMUNICATION SYSTEM

Chris J. Walter, Columbia; Colleen R. Wilson, Westminister, and Semyon Berkovich, Rockville, all of Md., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 3, 1982, Ser. No. 439,012
Int. Cl.³ H04J 3/00
U.S. Cl. 370—119 **27 Claims**



1. A method for transmitting data from a plurality of senders to a receiver over a single communication channel characterized by the steps of:

storing in a data register in each sender a multibit data word indicative of the data to be transmitted to the receiver, each bit having one of two possible states;

storing in a word boundary register in each sender the number of bits in said data word;

storing in a bit position register in each sender the number of bits in said data word;

transmitting the highest order data bit in said data register to said communication channel;

detecting the state of the communication channel by each Sender to determine when the state of the communication channel is the same as the state of the transmitted data bit;

transmitting the next highest data bit when the state of the channel is the same as the state of the transmitted data bit;

decrementing said word boundary register and bit position register for each transmitted data bit whose state was the same as the state of communication channel;

terminating the transmission of the remaining data bits by each sender whose transmitted data bit is different from the state of the communication channel;

waiting by each sender which has terminated the transmission of its remaining data bits until the transmission of the data word currently being transmitted is completed;

perform bit competition in response to the end of the transmitted data word to determine if the content of the senders bit position register is lexicographically indicative of the next smallest data word;

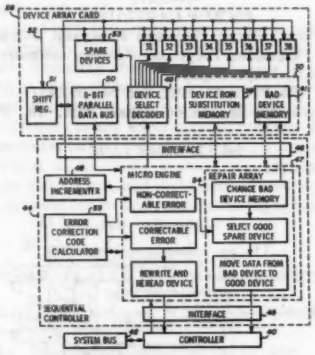
transmitting the remaining data bits to the communication channel when said bit competition affirms that its data word is indicative of the next lexicographically smallest data word; and

repeating said steps of detecting the state of the channel, transmitting the next highest data bit, terminating transmission, waiting by each sender, and performing bit competition until all of the senders have completed the sending of its stored data word.

4,493,075
SELF REPAIRING BULK MEMORY

James M. Anderson, Campbell; Thomas S. Knight, III, Sunnyvale; Dennis T. Kitagawa, and Ernesto Rey, both of San Jose, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 17, 1982, Ser. No. 379,202
Int. Cl.³ G11C 29/00; G06F 11/20
U.S. Cl. 371—10 **16 Claims**



1. A bulk memory system comprising in combination:

at least one array of storage devices, each of said devices having a multiplicity of memory cells arranged in a pattern of rows and columns;

data transfer means connected to all of the devices in the array;

row and column address supplying means connected to all of the devices in the array;

device selecting means operable to select and enable one device at a time, so as to connect said one device to the data transfer means, for the purpose of communicating with the memory cell addressed by said row and column address supplying means in the one device;

sequencing means connected to said address supplying means, operable to increment the address sequentially through successive memory cells so as to connect the successive cells to the data transfer means;

serial to parallel data conversion means connected to said transfer means so as to permit conversion of the serial bits

from said successive memory cells into parallel words; and

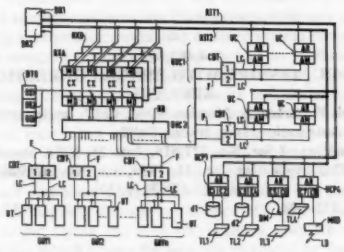
sequential controlling means connected to said address supplying means, said selecting means, said sequencing means, and said conversion means, responsive to external system requests for memory data to coordinate the enabling of devices and incrementing of addresses in such a way as to present parallel words to the external system.

4,493,076

SECURITY SYSTEM FOR A DISTRIBUTED CONTROL EXCHANGE

Abdel-Cader Khimèche, Chatenay Malabry, and Marc Kemler, Velizy-Villacoublay, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Sep. 20, 1982, Ser. No. 420,212
Claims priority, application France, Sep. 18, 1981, 81 17644
Int. Cl.[3] G06F *11/20*
U.S. Cl. 371—11 8 Claims



1. A security system for distributed control exchange having a time-division switching network, the exchange comprising:

a switching network, comprising switches and markers, said markers controlling the switching network;

groups of terminal units, each terminal unit comprising a plurality of terminals controlled by a microprocessor and being connected to the switching network via multiplex links;

peripherals including at least dialog terminals and data links via modems; and

exchange control means comprising a plurality of interchangeable control units and a plurality of peripheral control units for controlling the peripherals;

the interchangeable and the peripheral control units being connected to one another by two point-to-point links and being connected to the switching network by multiplex links, and each control unit and each peripheral control unit including a controlling microprocessor;

wherein each peripheral control unit, each interchangeable control unit, each point-to-point link, each switch, each multiplex link, each terminal unit, each terminal, and each peripheral constitutes a security block capable of being independently monitored for faults and wherein the security system is comprised of a multi-stage fault monitoring and fault reaction system, comprising;

a first level comprising security means in each microprocessor for detecting faults and for taking decisions concerning current processing;

a second level comprising means for managing said security blocks and for switching over from one block to another and for re-configuring the links affected by the switchover; and

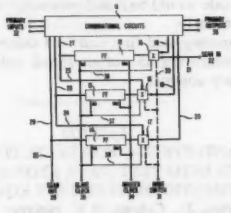
a third level comprising means for managing the microprocessors of the exchange control means and the two point-to-point links, said third level means comprising a pair of mass memories each containing a copy of the software needed to run the exchange, and a pair of peripheral control units for respectively controlling said mass memories.

4,493,077

SCAN TESTABLE INTEGRATED CIRCUIT

Vishwani D. Agrawal, New Providence, and Melvin R. Mercer, Warren, both of N.J., assignors to AT&T Laboratories, Murray Hill, N.J.

Filed Sep. 9, 1982, Ser. No. 416,271
Int. Cl.[3] G01R *31/28;* G06F *11/00*
U.S. Cl. 371—25 9 Claims



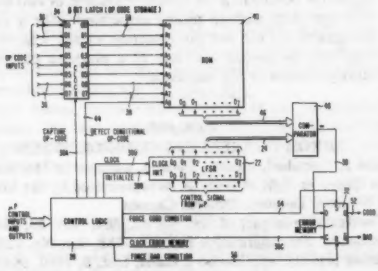
1. An integrated circuit adapted for scan testing and including combinational logic and storage elements normally interconnected for processing normal input data under control of a pair of control signals of which normally only one is active at a given time, comprising means responsive to a condition when both said control signals are active effectively to disconnect the storage elements from the associated combinational logic and to reconfigure the storage elements into one or more shift registers, and means for applying scan test data into said one or more shift registers and for passing such data therethrough for detection at an output.

4,493,078

METHOD AND APPARATUS FOR TESTING A DIGITAL COMPUTER

Stuart F. Daniels, Moorestown, N.J., assignor to Siemens Corporation, Iselin, N.J.

Filed Sep. 29, 1982, Ser. No. 428,036
Int. Cl.[3] G06F *11/00*
U.S. Cl. 371—25 29 Claims



1. A method for testing a digital computer having (a) processor means for executing instructions and (b) memory means, associated with said processor means, for storing the instructions to be executed by said processor means, said instructions being selected from a prescribed set of instructions, each separate instruction in said set being defined by a unique operation code; wherein said processor means includes a plurality of control signal outputs and means for generating control signals at said outputs upon execution of each instruction;

said method comprising the steps of

(a) detecting when an operation code for an instruction to be executed by said processor means is fetched from said memory means;

(b) monitoring said control signals appearing at said outputs during the execution of said instruction and producing a first signature code in response thereto, wherein one unique first signature code corresponds to each unique set of control signals;

(c) receiving the operation code of the instruction to be executed by said processor means and producing a second signature code in response thereto, said second signature code corresponding to what said first signature code would be if said processor means were operating properly;

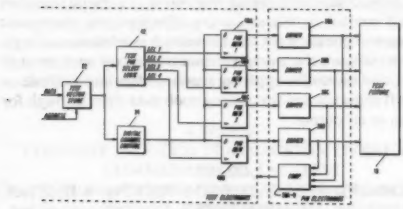
(d) comparing said first and said second signature codes and producing an output signal indicative of error if they are unequal.

4,493,079

METHOD AND SYSTEM FOR SELECTIVELY LOADING TEST DATA INTO TEST DATA STORAGE MEANS OF AUTOMATIC DIGITAL TEST EQUIPMENT

John H. Hughes, Jr., Cohoes, N.Y., assignor to Fairchild Camera & Instrument Corp., Clifton Park, N.Y.

Filed Aug. 18, 1982, Ser. No. 409,068
Int. Cl.³ G06F *11/00*
U.S. Cl. 371—27 **8 Claims**



1. In a digital test system including a plurality of test pins and test data storage means individually associated with each of the test pins, a system for selectively loading test data into the test data storage means comprising:

means for associating a digital test pin selection signal with said test data; and,

control means responsive to the digital test pin selection signal for controlling the selective loading of said test data into test data storage means associated with a test pin designated by the test pin selection signal, whereby test data may be loaded into any of a plurality of test data storage means in any sequence.

4,493,080

ERROR CORRECTING CODE DECODER

Russell J. Campbell, Kanata, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

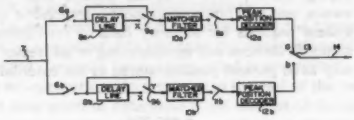
Continuation-in-part of Ser. No. 323,809, Nov. 23, 1981, abandoned. This application Sep. 23, 1982, Ser. No. 422,465
Claims priority, application Canada, Dec. 8, 1980, 366304
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—37 **36 Claims**

1. A coded signal decoder comprising:

(a) first means for concatenating a cyclic block coded input signal, having a period of a predetermined codeword, with itself,

(b) a first filter matched to a first predetermined code sequence of said signal connected to receive the concatenated signal;

(c) a first peak position decoder connected to receive an output signal from the matched filter for providing an indication of the position of an autocorrelation peak corresponding to said code sequence relative to the input signal code, whereby the particular code is designated.

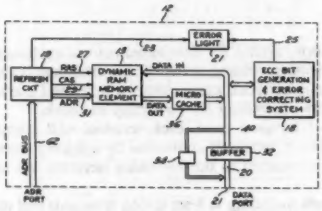


4,493,081

DYNAMIC MEMORY WITH ERROR CORRECTION ON REFRESH

Frederick W. Schmidt, Mission Viejo, Calif., assignor to Computer Automation, Inc., Irvine, Calif.

Continuation of Ser. No. 277,614, Jun. 26, 1981, abandoned. This application Jan. 11, 1984, Ser. No. 569,924
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—38 **12 Claims**



1. A memory for correcting stored data during refresh cycles including:

dynamic storage array means having data words stored in rows and columns of address locations, data inputs and outputs, address inputs, row address strobe inputs and column address strobe inputs, said storage array means for storing and retrieving data words at selected row and column addresses and for refreshing the data stored in a selected row at predetermined times and for receiving a selected data word from the row being refreshed during each refresh cycle and for correcting it and re-storing it at the same address and for presenting data at said data output from the address selected by signals at said address inputs;

an address bus for guiding memory address signals;

a clock;

refresh counter means coupled to said address inputs and to said clock for supplying sequential addresses to said address inputs during said refresh cycles;

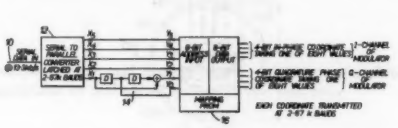
means coupled to said address bus and coupled to said row address strobe inputs for supplying said row address strobe signals to said row address strobe inputs; and

means coupled to said address bus and coupled to said refresh counter means for supplying column address strobe signals to said column address strobe inputs.

4,493,082
SOFT DECISION CONVOLUTIONAL CODE TRANSMISSION SYSTEMS

John Cumberton, Danbury, Conn.; Alun E. Foster, Groot-Bijgaarden, Belgium; Alexander S. Rae, Farnham, England; Vernon J. Fernandes, Tilehurst, England, and Michael R. Carter, Maidenhead, England, assignors to Plessey Overseas Limited, Ilford, England

Filed Nov. 13, 1981, Ser. No. 320,923
Claims priority, application United Kingdom, Nov. 14, 1980, 8036705
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—43 12 Claims

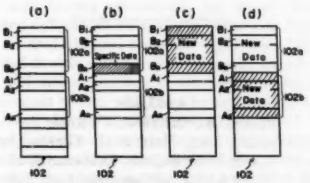


1. A transmission system for the transmission of data or digitized analogue information from a transmitter to a receiver including a transmitter containing a convolutional encoder and a signal mapping device connected thereto to produce a two dimensional coded output signal, and including a receiver containing a convolutional decoder with soft decision decoding, connected to a reverse mapping means to produce output data, said transmitter including a serial-to-parallel converter producing n binary outputs only one of which is fed to the convolutional encoder which produces two binary output bits which are combined with the n−1 remaining bits and fed to the signal mapping device to produce the two dimensional coded output signal, the n−1 bits defining a square within a grid, within which square the two bits produced by the convolutional encoder define the position of the signals to be transmitted.

4,493,083
SYSTEM FOR UPDATING DATA IN BUBBLE MEMORIES

Mitsuo Kinoshita, Hachioji, Japan, assignor to Fanuc Ltd., Tokyo, Japan

PCT No. PCT/JP81/00340, § 371 Date Jul. 27, 1982, § 102(e) Date Jul. 27, 1982, PCT Pub. No. WO82/01958, PCT Pub. Date Jun. 10, 1982
PCT Filed Nov. 18, 1981, Ser. No. 403,661
Claims priority, application Japan, Nov. 28, 1980, 55-167770
Int. Cl.³ G11C *29/00*; G06F *11/00*
U.S. Cl. 371—66 3 Claims



1. A data update method for updating data stored in a bubble memory with new data, the bubble memory having first and second data storage areas, the data update method in the bubble memory comprising the steps of:

writing initialization data in the first data storage area of the bubble memory before updating of the data;

updating the data, comprising the steps of:

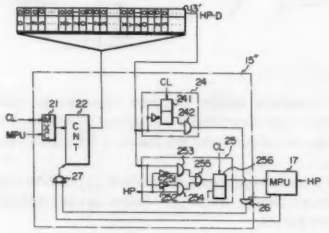
writing the new data into the first data storage area, the initializaton data being erased by completing the writing of the new data; and

writing the new data into the second data storage area.

4,493,084
BELT SYNCHRONOUS CHECK SYSTEM FOR A LINE PRINTER

Tomomichi Adachi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 8, 1982, Ser. No. 415,930
Claims priority, application Japan, Sep. 10, 1981, 56/142926
Int. Cl.³ B41J *1/20*
U.S. Cl. 371—67 5 Claims



1. A belt synchronous check system for a line printer including a type-belt having a plurality of character sets each of which has the same characters, the line printer further including first signal generating means for generating signals indicating the locations of individual characters, second signal generating means for generating signals indicating the reference marks of the character sets, and a belt image memory for storing the character codes of the characters, the belt synchronous check system comprising:

counter means, operatively connected to the first signal generating means and the belt image memory, for receiving and counting the signals from the first signal generating means and outputting a signal corresponding to the reference marks of the character sets in the belt image memory;

flag-generating means, provided in the belt image memory and operatively connected to said counter means, for generating flag bits corresponding to the reference marks of the character sets in dependence upon the signal from said counter means corresponding to the reference marks of the character sets;

determination means, operatively connected to said flag-generating means in the belt image memory and to the second signal generating means, for receiving the flag bits and for comparing the flag bits with the signals from the second signal generating means and providing an output signal if the flag bits and the signals from the second signal generating means are the same; and

control means, operatively connected to said determination means and said counter means, for receiving the output signal from said determination means and clearing said counter means.

4,493,085
AGILE BEAM LASER

George C. Valley, Los Angeles, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed May 19, 1982, Ser. No. 379,588
Int. Cl.³ H01S *3/00, 3/098*
U.S. Cl. 372—19 14 Claims

1. Laser apparatus comprising:

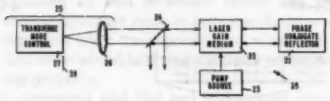
phase conjugate reflecting means for reflecting laser energy which is the phase conjugate of laser energy incident thereupon;

optical means for providing a plurality of selectable transverse lasing modes between said optical means and said

phase conjugate reflecting means, each of said plurality of transverse lasing modes having a predetermined wavefront tilt in the near field;

laser gain medium disposed between said optical means and said phase conjugate reflecting means for providing said laser energy which is reflected therebetween;

laser pumping means operatively connected to said lase gain medium for providing excitation energy for said laser medium; and



output coupling means disposed adjacent to said optical means in said near field for coupling a portion of said laser energy out of said laser apparatus as an output beam therefrom;

whereby said output beam is steerable in position determined by the particular transverse lasing mode selected by said optical means.

4,493,086

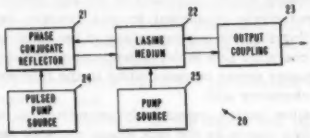
SYNCHRONOUSLY-PUMPED PHASE-CONJUGATE LASER

Ravinder K. Jain, Calabasas, and Concetto R. Giuliano, Malibu, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed May 20, 1982, Ser. No. 379,837

Int. Cl.³ H01S *3/00, 3/091*

U.S. Cl. 372—21 **20 Claims**



1. Laser apparatus comprising a lasing medium disposed along an optical path, phase-conjugate reflecting means disposed at one end of said optical path adjacent to said lasing medium for reflecting laser energy which is the phase conjugate of laser energy incident thereupon, and output coupling means disposed at the other end of said optical path adjacent to said lasing medium in order to form a laser resonator between said phase-conjugate reflecting means and said output coupling means for reflecting a substantial portion of the laser energy incident thereupon to sustain laser operation and for transmitting a portion of the laser energy as an output beam, wherein the improvement comprises:

pumping means for applying laser pulses to said phase-conjugate reflecting means and to said lasing medium, said laser pulses having a relatively high peak power and relatively low average power, said laser pulses having a predetermined periodicity which matches the round-trip time for laser energy traversing said resonator, said laser pulses being applied to said phase-conjugate reflecting means and said lasing medium when the laser energy traversing said resonator is present therein.

4,493,087

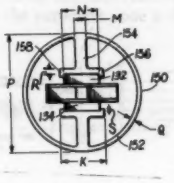
RF EXCITED WAVEGUIDE GAS LASER

Katherine D. Laakman, and Peter Laakmann, both of Laguna Niguel, Calif., assignors to Walwel, Inc., San Juan Capistrano, Calif.

Continuation of Ser. No. 103,162, Dec. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 78,343, Sep. 24, 1979, Pat. No. 4,373,202. This application May 27, 1982, Ser. No. 382,529

Int. Cl.³ H01S *3/03*

U.S. Cl. 372—64 **1 Claim**



1. In a waveguide laser structure of the type having means for defining an elongated chamber of a specified length and of cross-sectional dimensions suitable for guiding laser light and for generating therein a laser exciting discharge and an active laser gas disposed in said chamber, said laser gas having a laser transition capable of providing stimulated emission of quanta of light energy at a desired wavelength, wherein the improvement comprises:

means for establishing an alternating electric field in said chamber to establish the laser-exciting discharge in said laser gas; and

an elongated generally cylindrical elastic metal tube housing of generally constant circular cross-sectional dimensions having a longitudinally extending axis therethrough and including a pair of elongated spaced-apart parallel shelves inwardly extending from diametrically opposed locations along interior portions of said tube along the length of said tube in a direction generally parallel to said longitudinal axis and wherein the inner distance between the spacing of such shelves is normally constant along said length but increases as opposed external forces are applied to the tube in a plane intermediate said shelves, wherein said shelves are configured and dimensioned to retain said means for defining an elongated chamber in compressive engagement along the entire chamber length absent such opposed forces.

4,493,088

PLASMA MELTING FURNACE

Walter Lugscheider, Linz; Helmut D. Kilches, Asten; Ernst Riegler, Enns, and Ernst Zajicek, Ottensheim, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jan. 4, 1982, Ser. No. 336,901

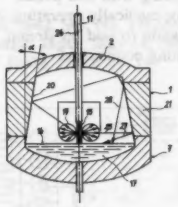
Claims priority, application Austria, Jan. 13, 1981, 99/81

Int. Cl.³ F27D *1/00, 7/00*

U.S. Cl. 373—22 **3 Claims**

1. In a plasma melting furnace of the type including a furnace interior having an axis, a furnace lining surrounding said furnace interior and having an inner surface, and at least one plasma burner penetrating said furnace lining to a point above the surface of a bath within said furnace interior, in particular a plasma burner projecting vertically into said furnace interior, the improvement which is characterized in that said inner

surface of said furnace lining is conical and inclined, converging upwardly at a convergent angle α, whereby heat radiation



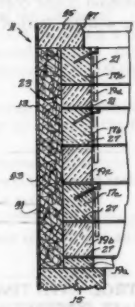
emanating from said plasma burner on a horizontal plane perpendicular to said axis is reflected into said bath.

4,493,089

ELECTRIC FURNACE INSULATION

R. Bruce Abell, Algonquin, Ill., assignor to Refractory Poroducts Co., Elgin, Ill.

Filed Mar. 21, 1983, Ser. No. 477,123
Int. Cl.³ H05B 3/66; F27D 1/00
U.S. Cl. 373—130 **18 Claims**



1. An electric resistance heated furnace which comprises an outer shell having a top opening for access to the interior thereof,

a plurality of prefabricated, form-retaining, self-supporting, integral insulation rings made of ceramic fibers bonded together with an inorganic binder to form a rigid one-piece body having substantially flat top and bottom surfaces and cylindrical interior and exterior surfaces, at least some of said integral rings having a plurality of holes provided therein which extend generally radially outward from said interior surface at circumferentially uniformly spaced-apart points, said holes being disposed so that the centerlines thereof are downwardly inclined from said interior surface and oriented at an angle of between about 25° and about 65° thereto, said integral rings having an outer diameter less than the inner diameter of said shell and being spaced therefrom to provide an annular region therebetween, said rings being stacked vertically one atop another with the interior surfaces thereof defining a cylindrical furnace cavity and with each said integral ring supporting the weight of the overlying rings,

fibrous insulation within said annular region,

a plurality of high-temperature-resistant hangers each having a straight, elongated end section disposed in one of said holes, a short intermediate section formed at an angle of between about 115° and about 155° to said elongated end section, and an upturned interior end section at the other end of said intermediate section, and

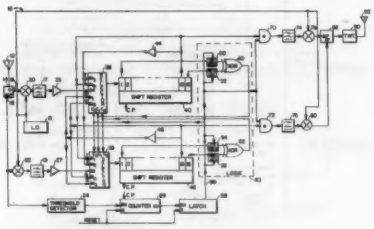
electric resistance ribbon heating elements hanging in depending loops from said intermediate sections.

4,493,090

MEMORY SYSTEM

Bruce E. Gordon, Santa Barbara, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 27, 1982, Ser. No. 453,551
Int. Cl.³ H04B 13/00
U.S. Cl. 375—4 **4 Claims**



1. Apparatus comprising:

means for storing first and last samples of a recorded segment of a periodic signal;

means, responsive to the stored first and last samples, for producing a control signal indicative of the difference between the first and last samples; and

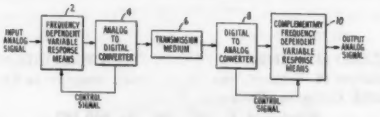
means, responsive to the control signal, for sequentially reading from the storing means a portion of the recorded segment, each sequentially read portion of the recorded segment having a phase shift relative to the phase shift of a preceding sequentially read segment related to the difference between the stored first and last samples, producing an output signal for a time duration greater than the recorded segment of the periodic signal and having the same frequency as the frequency of the periodic signal.

4,493,091

ANALOG AND DIGITAL SIGNAL APPARATUS

Kenneth J. Gundry, San Francisco, Calif., assignor to Dolby Laboratories Licensing Corporation, San Francisco, Calif.

Filed May 5, 1982, Ser. No. 375,037
Int. Cl.³ H04B 12/02; H03G 7/00
U.S. Cl. 375—30 **26 Claims**



1. An analog to digital conversion system comprising:

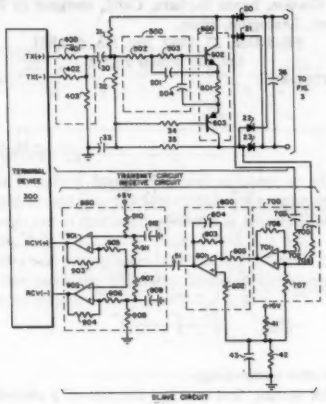
analog to digital converter means having characteristics that adapt to an applied signal, said converter means including means for generating a control signal derived from said applied signal for controlling said characteristics, and

frequency dependent variable response means for processing a signal prior to its application to said converter means, said variable response means having the shape of its response characteristic varying in response to said control signal.

4,493,092
INTERFACE CIRCUIT FOR DIGITAL SIGNAL TRANSMISSION SYSTEM

Tello D. Adams, Seminole, Fla., assignor to GTE Automatic Electric, Inc., Northlake, Del.

Filed Dec. 17, 1982, Ser. No. 450,615
Int. Cl.³ H04L 5/14
U.S. Cl. 375—36 24 Claims



1. An interface circuit for digital signal transmission system for use between first and second digital signaling devices, each device being operative to provide digital device signals of first, second and third characteristics, said digital signal tranismission system comprising:

first and second line interface devices connected to said first and second digital signaling devices, respectively;

a transmission line connected between said first and second line interface devices;

each of said first and second line interface devices being operative in response to said digital device signal of said first characteristic to provide bias current in said transmission line; and each being further operative in response to said digital device signals of said second and third characteristics to modulate said bias current with modulation signals of first and second characteristics, respectively; and each of said first and second line interface devices being further operative in response to said bias current to provide a digital interface signal of a first characteristic and each being further operative in response to said modulation signals of said first and second characteristics to provide digital interface signals of second and third characteristics, respectively; said digital signaling devices each being further operative to receive said digital interface signals of said first, second and third characteristics.

4,493,093
ZERO OVERHEAD SYNC IN DATA RECORDING

Dominique H. Veillard, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 8, 1982, Ser. No. 440,143
Int. Cl.³ H04L 7/02
U.S. Cl. 375—110 10 Claims

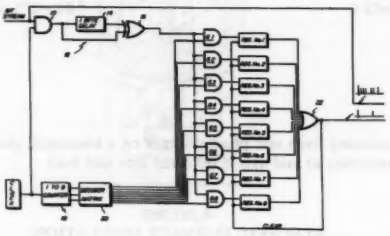
1. Apparatus adapted to receive a bit stream comprised of a succession of bytes which are each comprised of N bits per byte, there being no synchronizing data between said bytes to signify where one byte begins and another byte ends, said bits occurring at a predetermined bit rate,

said apparatus being further adapted to identify the start and end of said bytes and being comprised of:

(a) means for comparing on a byte-by-byte basis like order bits of said bit stream, and for producing a pulse each time any given order bit changes from one byte to the next byte, thereby to produce a succession of pulses,

(b) N means for accumulating counts in predetermined corresponding with said pulses,

(c) means for cyclically operating, one after the other, in timed relation to said bit stream, respective means for accumulating counts, and

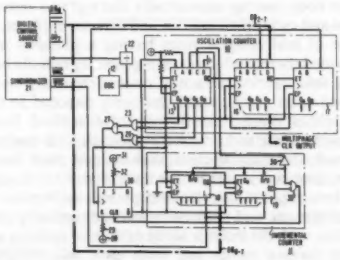


(d) means, cooperative with said means for accumulating counts, responsive to a predetermined threshold count in one of said means for accumulating counts, for producing a sync pulse when said threshold count is reached, thereby to signify that the bit occurring at the time of said threshold count corresponds in a certain timed relationship with the start of one byte and the end of another byte.

4,493,094
CLOCK PHASE CONTROL WITH TIME DISTRIBUTION OF PHASE CORRECTIONS

David J. Thomson, New Providence, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 26, 1982, Ser. No. 411,531
Int. Cl.³ H03K 5/135
U.S. Cl. 375—119 4 Claims



1. A clock phase control system comprising

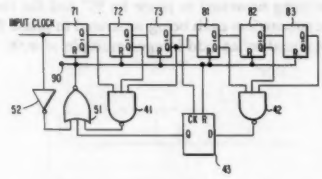
a programmable clock oscillation counter, and

means, responsive to a single set of digital signals representing a phase error magnitude, for adjusting the phase of said oscillation counter in multiple periodic steps until a total adjustment equal to said magnitude has been achieved.

4,493,095
COUNTER HAVING A PLURALITY OF CASCADED FLIP-FLOPS

Akira Yazawa, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,356
Claims priority, application Japan, May 14, 1981, 56-72503
Int. Cl.³ H03K 21/32, 21/34
U.S. Cl. 377—107 17 Claims



1. A counter comprising

a first counter section including a plurality of cascaded flip-flops, said first counter section receiving and counting an input signal and producing a first output signal, said first counter section further including means for generating a second output signal having the same repetition frequency as said first output signal but having a phase opposite to said first output signal;

a second counter section including a plurality of cascaded flip-flops, said second counter section receiving and counting said second output signal from said first counter section;

a first detector producing a first partial output in response to a predetermined set of states of the flip-flops in said first counter section;

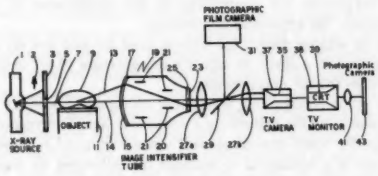
a second detector producing a second partial output in response to a predetermined set of states of the flip-flops in said second counter section; and

a third detecior producing a count output in response to the concurrent existence of said first and second partial outputs.

4,493,096
METHOD OF X-RAY IMAGING USING SLIT SCANNING WITH CONTROLLED TARGET ERASE

Richard J. Rieke, Brookfield, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Dec. 17, 1982, Ser. No. 450,589
Int. Cl.³ A61B 6/00; H04N 7/18
U.S. Cl. 378—99 14 Claims



1. A method of imaging the internal features of an object undergoing examination, comprising the steps of:

(a) scanning said object with a substantially planar beam of x-ray radiation in a direction substantially orthogonal to the plane of said beam, such that a fraction of said radiation is transmitted through said object in accordance with the attenuative properties of the internal features thereof as primary imaging radiation;

(b) converting radiation emanating from said object, including said primary imaging radiation, to optical wavelength radiation suitable for detection by television camera means having a latent image storage element;

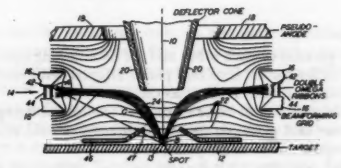
(c) erasing a predetermined region of said storage element immediately prior to exposing said region to said optical wavelength radiation, including that produced by said primary imaging radiation, wherein exposure of said storage element to said optical wavelength radiation in the course of a scan creates a complete latent image on said storage element of the internal features of said object scanned by said x-ray beam;

(d) reading out, upon completion of said step of scanning, said complete latent image so as to produce video signals suitable for displaying said latent image on television monitor means.

4,493,097
ELECTRON GUN ASSEMBLY

Robert H. Clayton, Ridgefield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 30, 1982, Ser. No. 412,461
Int. Cl.³ H01J 3/00
U.S. Cl. 378—137 12 Claims



1. An electron gun assembly, having a system axis, for use in x-ray lithography comprising, in combination, an annular electron emitter assembly having its center substantially on said system axis, beam forming means encompassing said electron emitter assembly in a sandwich-like manner to form a bundle of electrons directed substantially radially inwardly toward said system axis, an anode target mounted substantially perpendicular to said system axis and in axially spaced relationship in a first direction with respect to the plane of said electron emitter assembly, deflector means having an elongated internal cavity disposed substantially concentrically about said system axis, said deflector means being mounted radially inwardly of said electron emitter assembly and axially near the plane of said electron emitter assembly, an annular pseudoanode mounted perpendicular to the system axis, said pseudoanode being radially outwardly disposed with respect to said deflector means and having its center disposed substantially on said system axis in axially spaced relationship in a direction opposite said first direction with respect to the plane of said electron emitter assembly, whereby electrons freed from said electron emitter assembly are drawn radially inwardly by the attractive electrostatic force generated by both said anode target and said pseudoanode and thereafter said deflector means deflects said electrons in an axial direction toward said anode target.

4,493,098
X-RAY COLLIMATOR

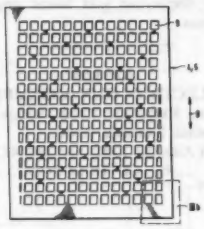
Esko Riihimäki, Espoo, and Ossi Korhola, Helsinki, both of Finland, assignors to Radiographic Screens Oy, 03, FIX

Filed Apr. 26, 1982, Ser. No. 372,203
Claims priority, application Finland, Apr. 29, 1981, 811339
Int. Cl.³ G03B 41/16
U.S. Cl. 378—146 9 Claims

1. In an X-ray device having a source of X-rays emitted from a focal point, first support means for supporting an object to be X-rayed and second support means for supporting film for receiving an X-ray image, the X-rays being emitted in an X-ray direction, an X-ray collimator comprising:

at least three perforated collimator plates each having a plurality of holes, at least one of said plates positioned between the focal point and the first support means and at least two of said plates positioned between the first and second support means, with said holes of each plate being at least as wide as a thickness of each plate; and

plate drive means connected to said at least three perforated plates for moving said plates in a collimator translation direction from a first extreme position to a second extreme position, said translation direction being substantially perpendicular to the X-ray direction, said plate drive means connected to said plates for maintaining said plates



parallel to each other and for maintaining said plurality of holes for each of said plates aligned with each other and aligned with respect to the focal point;

said plurality of holes of each of said plates being positioned on said plates to permit alignment of said holes with respect to the focal point;

said plurality of holes on each of said plates each being similar in shape to the other, said holes on each plate positioned in a plurality of rows and columns, said columns extending substantially perpendicular to said translation direction and said rows extending at an acute angle to said columns.

4,493,099

FM BROADCASTING SYSTEM WITH TRANSMITTER IDENTIFICATION

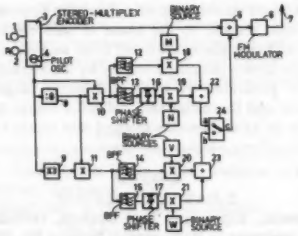
Johan M. Schmidt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 18, 1982, Ser. No. 340,165

Claims priority, application Netherlands, Jan. 29, 1981, 8100419

Int. Cl.³ H04H *5/00*

U.S. Cl. 381—14 **4 Claims**



1. An FM transmitter for an FM-broadcasting system for transmitting a multiplex signal which is frequency modulated on a main carrier wave comprising means for generating an audio-frequency first information signal and, in the case of a stereo transmission, a second information signal modulated on a suppressed stereo subcarrier wave, means for generating a stereo pilot signal whose frequency is situated between the frequency spectra of the two information signals, means for generating a first binary code signal which is phase-modulated on a first code subcarrier situated outside said frequency spectra, said code subcarrier being a harmonic of a subharmonic of the stereo pilot, which harmonic does not coincide with a harmonic of said pilot, characterized in that the transmitter further comprises means for generating at least a second binary code signal, which is independent of the first binary code signal and which is binary phase-modulated on a second code subcarrier, which two code subcarriers have frequencies which are situated symmetrically about the stereo pilot signal frequency or a harmonic thereof, the two resultants of the two code subcarriers being separated in phase by 90° and the two resultants of the subcarriers each being separated in phase from the stereo pilot signal by an odd integer multiple of $\pi/4$.

4,493,100

APPARATUS FOR CONTROLLING AIR CONDITIONER BY VOICE

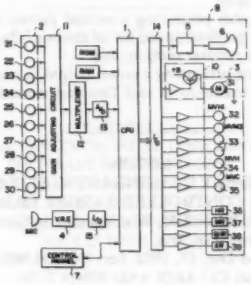
Masakazu Moriyama, and Takao Saito, both of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushikik Kaisha, Toyota, Japan

Filed Feb. 24, 1982, Ser. No. 351,883

Claims priority, application Japan, Mar. 9, 1981, 56-33471

Int. Cl.³ G10L *1/00*; G05D *23/00*

U.S. Cl. 381—43 **14 Claims**



1. Apparatus for controlling an air conditioner by voice command, the apparatus comprising:

(a) air mixing means for mixing cool air and hot air introduced to a space to adjust a temperature of air delivered from the air conditioner;

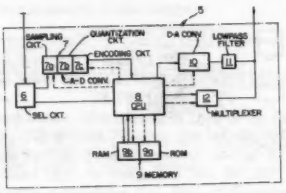
(b) voice recognizing means for recognizing a voice command and for delivering a command signal corresponding to the voice command, said voice command representing one of a command to increase the delivered air temperature and a command to decrease the delivered air temperature; and

(c) control means for controlling said mixing means such that the delivered air temperature is stepwise increased in response to a command signal to increase the temperature and then is gradually decreased until the delivered air temperature is returned to a previously set level, and the delivered air temperature is stepwise decreased in response to a command signal to decrease the temperature and then is gradually increased until the delivered air temperature is returned to a previously set level.

4,493,101
ANTI-HOWL BACK DEVICE

Shigetaro Muraoka, 7-28, Osaki 2-chome, Shinagawa-ku, Tokyo, and Mineo Sakamoto, 16-12, Suido 2-chome, Bunkyo-ku, Tokyo, both of Japan

Filed Oct. 14, 1982, Ser. No. 434,424
Claims priority, application Japan, Oct. 14, 1981, 56-163998
Int. Cl.³ H04B 15/00
U.S. Cl. 381—93 2 Claims

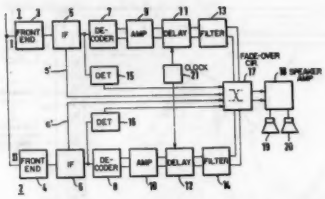


1. An anti-howl back device comprising:
a selector circuit for separating an input signal into a combination signal comprising a synchronous signal and an address signal and into an audio signal;
an A-D converter connected to said selector circuit for providing an A-D conversion of said audio signal;
a CPU connected to said A-D converter and said selector circuit;
a D-A converter connected to said CPU for providing a D-A conversion of signals which have been processed by said CPU;
a multiplexer for adding said combination signal comprising a synchronous signal and an address signal to an output signal from said D-A converter;
a memory system connected to said CPU for storing a program for operating said CPU and for storing data processed by said CPU;
wherein said CPU makes a decision on the presence of said combination signal which is output from said selector circuit and, upon an affirmative result of such a decision, causes said A-D converter to carry out an A-D conversion of a sample of said audio signal obtained by a sampling performed in synchronism with said synchronous signal, and subtracts data fetched from an address in said memory system corresponding to said address signal which is combined with said synchronous signal from data which has been derived as a result of said A-D conversion, and stores new data corresponding to said subtraction in said memory system while concurrently feeding said new data to said D-A converter, and then causes said multiplexer to add an output from said D-A converter to said combination signal comprising said synchronous signal and said address signal and corresponding to the address of said new data that has been stored in said memory system; and, upon a negative result of such a decision, causes said A-D converter to carry out an A-D conversion of said audio sample and stores such new data thus obtained in said memory system while concurrently feeding such new data to said D-A converter, and then causes said multiplexer to add an output from said D-A converter to said combination signal comprising said synchronous signal and said address signal and corresponding to said address of said new data that has been stored in said memory system.

4,493,102
PROCESS AND APPARATUS FOR ALTERNATELY SWITCHING RADIO SIGNALS OVER RESPECTIVE AUDIO CHANNELS

Walter Weishaupt, and Wilfried Steins, both of Munich, Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 5, 1983, Ser. No. 482,002
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1982, 3212615
Int. Cl.³ H04B 7/08
U.S. Cl. 381—2 10 Claims

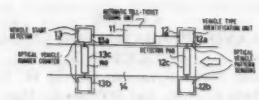


1. A process for switching over to alternate reproducing channels the reproduction of a first radio signal and a second radio signal of the same modulation content but of a different frequency mode, comprising the steps of, delaying the reproduction of the radio signals with respect to their reception by a first predetermined time period, detecting the occurrence of an interference in a corrupted one of said first and second radio signals, and decreasing the intensity of the corrupted one of said radio signal while increasing the intensity of the other interference-free radio signal to the same modulation during a second predetermined time period.

4,493,103
AUTOMATIC TOLL-TICKET ISSUING APPARATUS

Riichiro Yamashita, Takasago, and Osamu Satonishi, Kobe, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha

Filed Apr. 23, 1982, Ser. No. 371,246
Claims priority, application Japan, Apr. 28, 1981, 56-64732; May 13, 1981, 56-71765
Int. Cl.³ G08G 1/00; G06K 9/00
U.S. Cl. 382—1 6 Claims



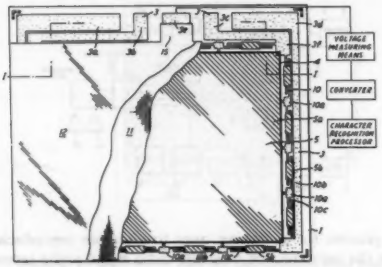
1. An automatic toll-ticket issuing apparatus for location along a path of movement of vehicles in the forward direction comprises a vehicle-type identification unit for identifying the type of each oncoming vehicle, a toll-ticket issuing unit installed downstream along the vehicle path of movement from the identification unit, and a vehicle-start detector installed downstream along the vehicle path of movement from the issuing unit, said toll-ticket issuing unit comprising a plurality of toll-ticket issuing slots open at different heights, means for holding a stack of new, unused toll tickets including a hopper, means for feeding the tickets one by one out of the hopper, means for recording the vehicle-type information, interchange number, and other necessary information on each ticket being fed, conveying means for sequentially transporting recorded tickets, each to an issuing slot at the height determined in response to the vehicle-type information from the vehicle-type

identification unit, and means for retrieving and storing any ticket left unpulled from any issuing slot by any driver, in response to vehicle passage information.

4,493,104
CHARACTER RECOGNITION DEVICE

Lawrence J. Lukis, Grand Island, N.Y., and Gerard P. Duhig, London, England, assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Dec. 11, 1981, Ser. No. 329,807
Int. Cl.³ G06K 9/28
U.S. Cl. 382—13 6 Claims



1. A character recognition device comprising a writing pad having a pair of sheets and a layer of reticulated material with reticules, one of the sheets comprising an area of high resistivity and the other one of the sheets comprising a layer of conductive material, the sheets being normally electrically insulated from one another while being constructed and arranged to be brought into contact with one another by application of writing pressure by a writing implement upon the writing pad, the sheets being adapted to be connected to an electrical switching circuit whereby current is caused to flow through the pad along two alernate paths and to a recognition circuit to recognize written characters by virtue of the change in electrical voltages in the alternate paths, the high resistivity sheet and the conductive sheet being separated by the layer of reticulated material and the conductive material being elastomeric and being sufficiently elastic to deform through the reticules of the reticulated material to provide continuous electrical contact between the sheets through the whole length of a writing stroke with said writing implement.

4,493,105
METHOD AND APPARATUS FOR VISUAL IMAGE PROCESSING

Donald L. Beall, North Syracuse; Harold W. Tomlinson, Jr., Liverpool, both of N.Y., and William G. Hart, Jr., Chagrin Falls, Ohio, assignors to General Electric Company, Orlando, Fla.

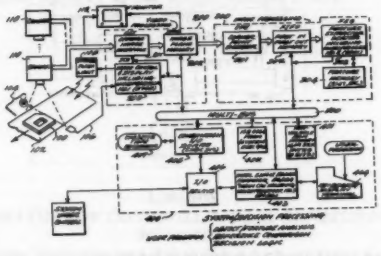
Filed Mar. 31, 1982, Ser. No. 363,664
Int. Cl.³ G06K 9/48
U.S. Cl. 382—21 22 Claims

1. A visual image processing system for digitally processing an electronic video image of an object within a pre-determined field of view so as to automatically identify closed edge contours of the object within such an image, said system comprising:

electronic video camera means for converting a predetermined visual field of view to a sequence of digital electronic video signals each of which represents a corresponding elemental picture element of such a visual field of view and for providing a new frame of such video signals in response to an input electronic command signal;

video processing means connected to said camera means and including an image plane memory means for temporarily storing video digital data produced in response to plural frames of said video signals and a first electronic control means for controlling said image plane memory means to accept said video digital data at a first data rate corresponding to the rate at which it is caused to occur by said camera means and to provide said video digital data at a second data rate, which may be different from said first data rate;

image processing means connected to receive successive frames of said temporarily stored video digital data from the image plane memory means and including: (a) corner point encoding means for identifying all contour corner points included in a given frame of said video digital data and for generating digital data representative thereof, (b)



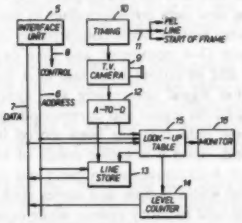
feature extracting sorter means for automatically sorting said corner point digital data into separate closed linked sets, each set being representative of one closed edge contour of an object thus identified in said video image, and (c) a second electronic control means connected to control the operation of said corner point encoding means and said feature extracting sorter means; and

third electronic control means connected to coordinate said first and second electronic control means so as to collect successive frames of said video digital data in said image plane memory means and to subsequently supply such collected data to said image processing means when it is next available for processing another frame of similar data.

4,493,106
IMAGE DIGITIZING SYSTEMS

Hassan Farhangi, Manchester; Peter R. Miles, Cheadle, and Costas N. Daskalakis, Manchester, all of England, assignors to International Computers Limited, London, England

Filed Mar. 31, 1982, Ser. No. 363,764
Claims priority, application United Kingdom, Dec. 24, 1981, 8138875
Int. Cl.³ G06K 9/00
U.S. Cl. 382—41 7 Claims



1. A system for digitising an image comprising:

means arranged repeatedly to scan an image and on each scan to output an analogue signal representing the image;

conversion means arranged periodically to convert the ana-

logue signal to a digital signal output from the conversion means, the successive values of which signal represent a display value for each individual picture element of the image;

counting means arranged to be operative during each of a plurality of scans to accumulate a count of the number of picture elements in the entire image whose display values meet a selected criterion;

selection means settable to select the said criterion; and

means for resetting the setting for the said selection means between scans of the said plurality in such a manner as to ensure that at the end of the said plurality of scans the sequence of counts accumulated during the said plurality of scans suffices to define a display-value histogram for the picture elements of the image.

4,493,107

METHOD AND DEVICE FOR IDENTIFYING DATA SUPPORTS

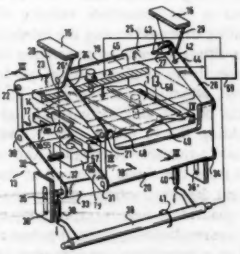
Hermann Stockburger, Kirnachweg 7, D-7742 St. Georgen, and Hans-Georg Winderlich, Niedere Str. 36, D-7730 Villingen, both of Fed. Rep. of Germany

Filed Mar. 24, 1981, Ser. No. 247,165

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1980, 3011317

Int. Cl.³ G06K *7/015*

U.S. Cl. 382—58 **4 Claims**



1. A device for identifying a data support comprising:

means for engaging said data support;

means for moving an engaged data support into an automatic processing system including a detection system for detecting information on said data support along a linear detection path; and

aligning means for aligning said data support in a detection position, including members laterally engaging two opposed edges of said data support and movable in a reciprocating manner transversely to said linear detection path symmetrically with respect thereto, wherein said laterally engaging members are movable by a system of linked levers forming a parallelogram, said parallelogram lying generally normally with respect to a receiving plane for receiving a generally flat data support and having two linking points lying in fixed positions on a line extending through said linear detection path.

4,493,108

VIDEO IMAGE FIELD CUT PROCESSING

George B. Fryer, Mint Hill, and David A. Stepneski, Cabarrus County, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,582

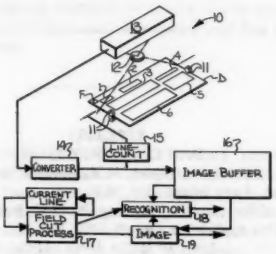
Int. Cl.³ G06K *9/20*

U.S. Cl. 382—61 **10 Claims**

7. A process for dissecting into predetermined fields image data received from a document, comprising

storing at a plurality of memory addresses a series of control instructions, one for each field of image data to be processed from within an image source area, each of said control instructions comprising a forward pointer to the control instruction for the next field to be processed, a rearward pointer to a prior control instruction in the series, an initial scan line number, and a function controller for specifying the function to be performed on the image data, and said series of control instructions being initialized such that the instructions in said series are ordered in the sequence of their contained initial scan line numbers,

receiving successive scan lines of image data which collectively represent the image source area, together with an associated identifying sequence number for each scan line, and upon receipt of each scan line



(a) accessing the first of said control instructions,

(b) comparing the scan line sequence number of the scan line presented with the initial scan line number of the accessed control instruction and terminating processing of the presented scan line if said initial scan line number is greater than said presented scan line sequence number, otherwise

(c) performing the functions specified by said function controller of the accessed control instruction,

(d) accessing by use of the forward pointer of the accessed control instruction, a further control instruction, and

(e) repeating operations (b) through (d) until processing of the presented scan line is terminated.

4,493,109

FLEXIBLE BULK CONTAINER WITH INTEGRAL LIFTING LOOPS

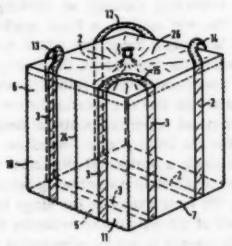
Frank Nattrass, Fallows End, Brearton, Harrogate, N. Yorkshire HG3 3BX, England

Filed Mar. 1, 1983, Ser. No. 471,017

Claims priority, application United Kingdom, Mar. 1, 1982, 8205961

Int. Cl.³ B65D *88/16, 90/00, 33/14, 33/02*

U.S. Cl. 383—7 **9 Claims**



1. A flexible bulk container having a base and four side walls each joined to the base and to the two adjacent side walls, the container being formed from a single elongated strip of woven

fabric of width substantially equal to the side wall width, the strip having two spaced parallel reinforcing bands extending longitudinally thereof and forming an integral part of the fabric, each band extending the full length of the strip and lying between the longitudinal centre line and a respective longitudinal edge of the strip, the strip having been cut away to leave connecting sections between strip sections which strip sections form the side walls of the container, each connecting section comprising a length of reinforcing band, the strip having been folded and stitched to form the container and to locate the connecting sections so that each extends between adjacent side panels over a respective corner of the bag and forms a lifting loop at that corner of the bag.

4,493,110

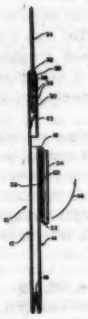
BAG CONSTRUCTION

James R. Wilson, Northport, N.Y., assignor to Equitable Bag Co., Inc., Long Island City, N.Y.

Division of Ser. No. 182,799, Aug. 29, 1980, Pat. No. 4,362,526. This application Oct. 8, 1982, Ser. No. 433,540

Int. Cl.³ B65D *33/06, 33/24*

U.S. Cl. 383—27 **2 Claims**



1. A plastic bag having front and rear panels connected by a horizontal bottom end and welded to one another along vertical edges extending upwardly from said bottom end to a location offset from the upper end of said rear panel, the rear panel having its upper end folded forward along a horizontal fold line and edge-welded to itself to form a top pocket that is substantially closed at its upper end and open along its bottom end, a handle extending through an opening in the closed upper end of the top pocket, a front pocket downwardly folded along a horizontal hinge line which is adjacent to the open bottom end of the top pocket, the front pocket comprising front-panel upper-end material folded forward against itself along a horizontal fold line at a location below said hinge line, the folded front-panel upper-end material being edge-welded to itself to define the front pocket closed on three sides and upwardly open along a horizontal alignment near said hinge line, the fold line of the front pocket being below the hinge line to substantially the same extent as the hinge line is below the closed upper end of the top pocket, whereby the front pocket can be upwardly swung to accept telescoping insertion of the top pocket, and an opening in the fold line of the front pocket through which the handle extends when the front pocket is telescoped over the top pocket.

4,493,111

ELECTRONIC ANTENNA DECOUPLING PROCESS AND DEVICE

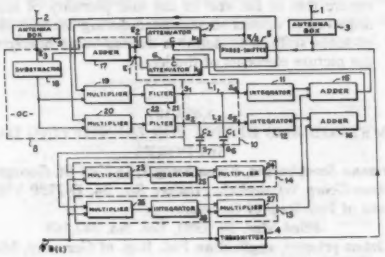
Hervé Ganem, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 15, 1982, Ser. No. 450,008

Claims priority, application France, Dec. 18, 1981, 81 23730

Int. Cl.³ H04B *1/44*

U.S. Cl. 455—79 **6 Claims**



1. An electronic antenna decoupling process for suppressing an intefering signal having a carrier frequency, modulated in frequency by a low frequency signal of amplitude $\phi'_B(t)$, emitted by a transmitting antenna and received by a receiving antenna situated in the immediate vicinity of the receiving antenna, consisting of transforming the intefering signal emitted by the transmitting antenna by generating in a phase shifter two signals respectively in phase and in quadrature with the interfering signal, attenuating the in phase and in quadrature signal by means of first and second adjustable attenuators, respectively adding the in phase and in quadrature signals attenuated by said adjustable attenuators and substracting the result obtained from the signal received at the receiving antenna, multiplying the substraction result by the non attenuated in phase and in quadrature signals respectively and filtering the two multiplication results for applying the two results obtained to the input of two integrators for obtaining at the output of these two integrators two static control signals for respectively controlling the attenuators so as to cancel out the component of the carrier frequency of the interfering signal received and superimposing on each of the static control signals a signal whose amplitude is proportional, at all times, to the difference between the carrier frequency of the interfering signal and the instantaneous value of the frequency of its modulation signal $\phi'_B(t)$.

4,493,112

ANTENNA TUNER DISCRIMINATOR

Warren B. Bruene, Dallas, Tex., assignor to Rockwell International Corporation, El Segundo

Filed Nov. 19, 1981, Ser. No. 322,822

Int. Cl.³ H04B *1/04*; H03H *7/40*

U.S. Cl. 455—123 **8 Claims**

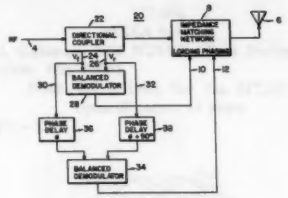
1. In the method of antenna tuning wherein loading and phasing control signals are supplied to an impedance matching network for matching an RF input impedance, an improved technique for supplying said loading and phasing control signals comprising:

sensing forward and reflected voltage samples V_f and V_r, respectively, on said RF input;

sensing the magnitude of the in-phase component of V_r relative to V_f and supplying a proportional amplitude as said loading control signal;

sensing the magnitude of the quadrature component of V_r relative to V_f and supplying a proportional amplitude as said phasing control signal;

such that the magnitude of each of said in-phase and quadrature V_r components is reduced to substantially zero to



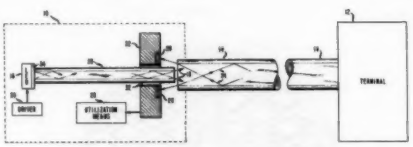
thus reduce the phasor amplitude of V_r to substantially zero and hence substantially eliminate reflected voltage.

4,493,113

BIDIRECTIONAL FIBER OPTIC TRANSMISSION SYSTEMS AND PHOTODIODES FOR USE IN SUCH SYSTEMS

Stephen R. Forrest, Chatham, and Richard L. Panock, Cranford, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 10, 1982, Ser. No. 416,467
Int. Cl.³ H04B 9/00
U.S. Cl. 455—606 **11 Claims**



1. A bidirectional optical transmission system comprising an optical transmission fiber, and

a transceiver coupled to each end of said fiber for transmission of outgoing radiation and detection of incoming radiation originating at a transceiver at the opposite end of said fiber, both outgoing and incoming radiation having the same wavelength

each transceiver including a semiconductor light-emitting device having a p-n junction for generating said outgoing radiation essentially parallel to said junction,

each transceiver further including a photodiode having a first active region of a first diameter and a first hole of a smaller second diameter extending through said photodiode in said first active region, said first active region being responsive to said incoming radiation for generating a signal photocurrent, and means for coupling said outgoing radiation through said first hole,

said transmission fiber being adapted to mix the modes of the radiation propagating therein, having a diameter much larger than that of said first hole, and having one end positioned adjacent said first active region so that said outgoing radiation is coupled through said first hole into said transmission fiber and said incoming radiation emanates from one end of said transmission fiber and is detected by said first active region to produce said signal photocurrent, said first hole being sufficiently small relative to said first active region so that an insignificant portion of said incoming radiation is coupled through said first hole, and

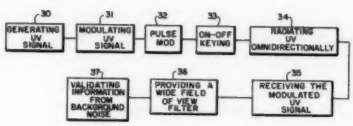
said coupling means comprising lens means effective to focus said outgoing radiation from said source to a point that lies approximately centrally within said first hole of said photodiode.

4,493,114

OPTICAL NON-LINE-OF-SIGHT COVERT, SECURE HIGH DATA COMMUNICATION SYSTEM

Myer Geller, San Diego; Thomas E. Keenan, La Mesa; Daniel E. Altman, San Diego, and Richard H. Patterson, Vista, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 2, 1983, Ser. No. 490,695
Int. Cl.³ H04B 9/00
U.S. Cl. 455—617 **13 Claims**



8. A method of communicating in the ultraviolet spectrum comprising:

generating an ultraviolet signal in the "solar blind" region in the tens of watts power range;

modulating the ultraviolet signal;

radiating the modulated ultraviolet signal omnidirectionally;

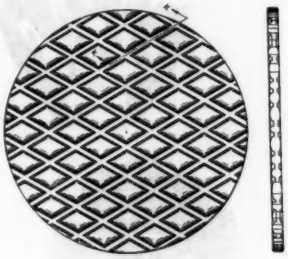
receiving the radiated modulated ultraviolet signal at a non-line-of-sight location anywhere within the range of the omnidirectionally radiated modulated ultraviolet signal; and

demodulating the received ultraviolet signal.

DESIGNS

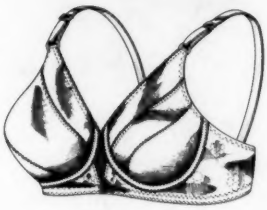
JANUARY 8, 1985

277,044
PIZZA SHELL
Harvey G. Kuhlman, N56 W21466 Silver Spring Rd., Menomonee Falls, Wis. 53051
Filed Nov. 2, 1981, Ser. No. 317,244
Term of patent 14 years
U.S. Cl. D1—130



277,045
FORMED MEAT PRODUCT
Rene Arend, Chicago, Ill., assignor to Restaurant Technology, Inc.
Division of Ser. No. 228,193, Jan. 26, 1981, Pat. No. Des. 270,299. This application Sep. 30, 1982, Ser. No. 431,826
Term of patent 14 years
U.S. Cl. D1—199

277,046
BRASSIERE
Toshiko Taniyama, White Plains, N.Y., assignor to International Playtex, Inc., Stamford, Conn.
Filed Aug. 23, 1982, Ser. No. 410,210
Term of patent 14 years
U.S. Cl. D2—24



277,047
BRASSIERE
Flavia DiTullio, New York, N.Y., assignor to Consolidated Foods Corporation, Winston-Salem, N.C.
Filed Sep. 17, 1982, Ser. No. 419,462
Term of patent 14 years
U.S. Cl. D2—24

277,048
COMBINATION JACKET AND CARRIER BAG
Irwin Peyser, Bay Shore, N.Y., assignor to MV Corp., Bay Shore, N.Y.
Filed Jun. 23, 1982, Ser. No. 391,344
Term of patent 14 years
U.S. Cl. D2—184

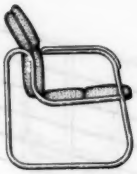
277,049
COMBINATION JACKET AND CARRIER BAG
Irwin Peyser, Bay Shore, N.Y., assignor to MV Corp., Bay Shore, N.Y.
Filed Jun. 23, 1982, Ser. No. 391,345
Term of patent 14 years
U.S. Cl. D2—184

277,050
DUSTING GLOVE
Ilene G. Bruseloff, 28501 Franklin Rd., Franklin, Mich. 48034
Filed Jul. 8, 1982, Ser. No. 396,514
Term of patent 14 years
U.S. Cl. D2—361

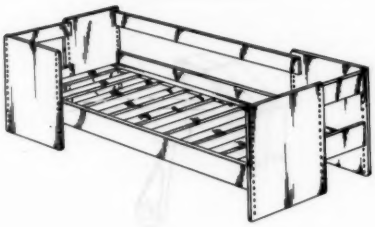
277,051
BELT BUCKLE
Peter Baron, 1150 E. Pico Blvd., Los Angeles, Calif. 90021
Filed Jan. 12, 1983, Ser. No. 446,338
Term of patent 14 years
U.S. Cl. D2—394

277,052
FRAME BELT BUCKLE
Peter Baron, 1150 E. Pico Blvd., Los Angeles, Calif. 90021
Filed Feb. 11, 1983, Ser. No. 446,341
Term of patent 14 years
U.S. Cl. D2—394

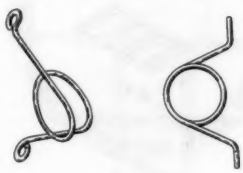
277,053
SEAT
Seymour W. Golden, 620 Cooper St., Delanco, N.J. 08075, and Robert N. Kehl, 6844 Souder St., Philadelphia, Pa. 19149
Filed Apr. 27, 1982, Ser. No. 372,452
Term of patent 14 years
U.S. Cl. D6—373



277,054
CONVERTIBLE BED
James R. Hull, 148 S. Westgate Ave., Los Angeles, Calif. 90049
Filed Apr. 12, 1982, Ser. No. 367,162
Term of patent 14 years
U.S. Cl. D6—393

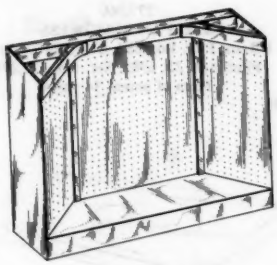


277,055
ANIMAL LEASH BRACKET
James W. Buchanan, 104 Chestnut Ave., Narberth, Pa. 19072
Filed Feb. 8, 1982, Ser. No. 346,433
Term of patent 14 years
U.S. Cl. D6—566

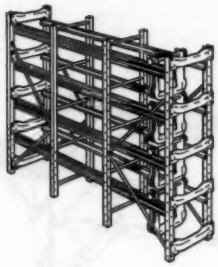


277,056
FOLDING TABLE
James H. Nicholson, Fair Oaks, Calif., assignor to Telic Systems, Inc., Fair Oaks, Calif.
Filed Jan. 31, 1983, Ser. No. 462,584
Term of patent 14 years
U.S. Cl. D6—420

277,057
MERCHANDISE DISPLAY STAND OR SIMILAR ARTICLE
Robert P. Franklin, Lake Hopatcong, N.J., assignor to Trans-World Manufacturing Corp., East Rutherford, N.J.
Filed Nov. 20, 1981, Ser. No. 323,234
The portion of the term of this patent subsequent to Dec. 25, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—480



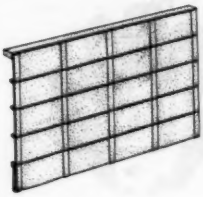
277,058
STORAGE RACK FOR ELONGATE GOODS
Anna G. D. Tortensson, Säffle, Sweden, assignor to Electrolux Constructor Aktiebolag, Säffle, Sweden
Filed Mar. 1, 1982, Ser. No. 353,854
Claims priority, application Sweden, Sep. 10, 1981, 81-1964
Term of patent 14 years
U.S. Cl. D6—468



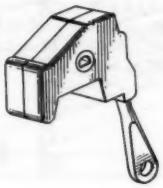
277,059
FACIAL PILLOW
Sheila T. Boone, 1129 SE. 34th, Portland, Oreg. 97214
Filed Aug. 13, 1979, Ser. No. 65,903
Term of patent 14 years
U.S. Cl. D6—601

277,060
BED PAN MATTRESS
Gunnar A. Ullven, P.O. Box 554, S-451 22 Uddevalla, Sweden
Filed Apr. 23, 1982, Ser. No. 371,275
Term of patent 14 years
U.S. Cl. 605

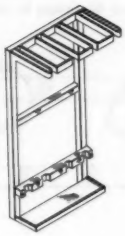
277,061
ROMAN SHADE
Anthony R. Picoy, 6185 Jared Ct., Woodland Hills, Calif. 91367
Filed Jun. 24, 1982, Ser. No. 391,949
Term of patent 14 years
U.S. Cl. D6—575



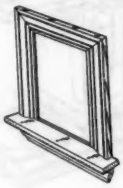
277,062
WORM GEAR UNIT FOR VENETIAN BLINDS OR THE LIKE
Hans R. Brolin, Mullsjö, Sweden, assignor to AB Perma System, Mullsjö, Sweden
Filed Mar. 8, 1982, Ser. No. 355,316
Claims priority, application Sweden, Jan. 15, 1982, 82-0077
Term of patent 14 years
U.S. Cl. D6—580



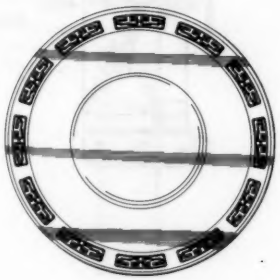
277,063
PICTURE FRAME
Richard F. Hauser, Mocksville, N.C., assignor to Trim, Inc., Mocksville, N.C.
Filed May 7, 1982, Ser. No. 375,719
Term of patent 14 years
U.S. Cl. D6—303



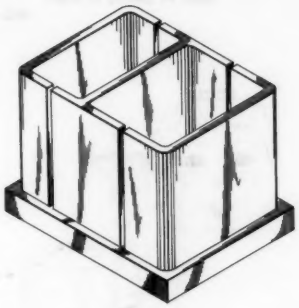
277,064
DISPLAY RACK FOR WATER SKIS
Robert R. Nagle, 128 N. Lott, Gibson City, Ill. 60936
Filed Oct. 28, 1982, Ser. No. 437,316
Term of patent 14 years
U.S. Cl. D6—467

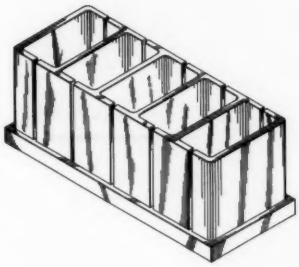


277,065
PLATE OR THE LIKE
Ming-Ter Chen, 1232-1236 E. Factory Pl., Los Angeles, Calif. 90013
Filed May 9, 1983, Ser. No. 492,885
Term of patent 14 years
U.S. Cl. D7—36

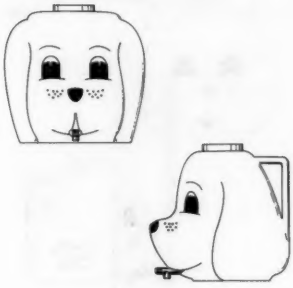


277,066
ROLL AND BAGEL SLICING JIG
Leonard Levine, 2978 Beechwood Blvd., Pittsburgh, Pa. 15217
Filed Jan. 3, 1983, Ser. No. 455,220
Term of patent 14 years
U.S. Cl. D7—43

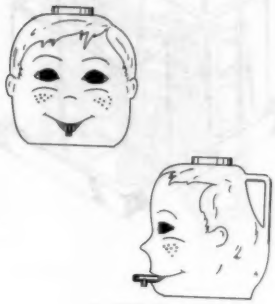




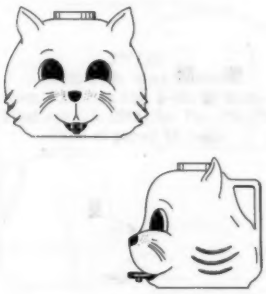
277,067
REFRIGERATOR BEVERAGE DISPENSER
Andra S. Ostergard, 4301 Norwood Rd., Baltimore, Md. 21218
Filed Sep. 29, 1982, Ser. No. 428,026
Term of patent 14 years
U.S. Cl. D7—302



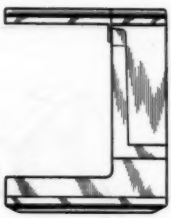
277,068
REFRIGERATOR BEVERAGE DISPENSER
Andra S. Ostergard, 4301 Norwood Rd., Baltimore, Md. 21218
Filed Sep. 29, 1982, Ser. No. 428,027
Term of patent 14 years
U.S. Cl. D7—302



277,069
REFRIGERATOR BEVERAGE DISPENSER
Andra S. Ostergard, 4301 Norwood Rd., Baltimore, Md. 21218
Filed Sep. 29, 1982, Ser. No. 428,028
Term of patent 14 years
U.S. Cl. D7—302



277,070
COFFEE MAKER
Marten F. Elkerbout, Peize, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 28, 1982, Ser. No. 393,201
Claims priority, application Netherlands, Jan. 6, 1982, 56438-02
Term of patent 14 years
U.S. Cl. D7—309



277,071

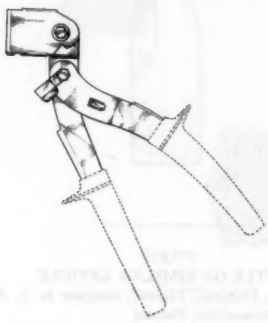
HEAD FOR A PLUG GRIP

Roger Malagnoux, Saint-Brice-Sous-Foret, France, assignor to Societe d'Exploitation des Etablissements Pierre-Grehal, Saint-Brice-Sous-Foret, France

Filed Sep. 11, 1981, Ser. No. 301,293

Term of patent 14 years

U.S. Cl. D8—52



277,072

DISPENSER FOR FLOWABLE PRODUCTS

Joachim Czech, Jahnstrasse 19, D-8504 Donaustauf, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 346,896

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1981, 16AR1793/81

Term of patent 14 years

U.S. Cl. D9—366

277,073

DISPENSER FOR FLOWABLE PRODUCTS

Joachim Czech, Jahnstrasse 19, D-8504 Donaustauf, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 346,898

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1981, 16 AR 1793/81

Term of patent 14 years

U.S. Cl. D9—366

277,074

DISPENSER FOR FLOWABLE PRODUCTS

Joachim Czech, Jahnstrasse 19, D-8504 Donaustauf, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 346,899

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1981, 16 AR 1793/81

Term of patent 14 years

U.S. Cl. D9—366

277,075
PERFUME BOTTLE
Cecile Blais, P.O. Box 421, Chatsworth, Calif. 91311; Willy Liechti, and Elizabeth Broderick, both of 6527 Escondido Canyon Rd., Acton, Calif. 93510
Filed Aug. 24, 1982, Ser. No. 410,931
Term of patent 14 years
U.S. Cl. D9—310

277,076
BOTTLE
Frederick N. Biesecker, Boyertown, Pa., assignor to Drug Plastics & Glass Company, Boyertown, Pa.
Continuation-in-part of Ser. No. 270,767, Jun. 5, 1981,. This application Nov. 3, 1983, Ser. No. 548,544
Term of patent 14 years
U.S. Cl. D9—355

277,077
COSMETIC BOTTLE
Yoichi Kaneko, Tokyo, Japan, assignor to Shiseido Company Ltd., Tokyo, Japan
Filed Jun. 17, 1982, Ser. No. 378,548
Term of patent 14 years
U.S. Cl. D9—367

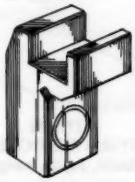
277,078
WINE BOTTLE
Pierre Dourthe, Bordeaux, France, assignor to Consortium Vinicole de Bordeaux et de la Gironde, Bordeaux, France
Filed Oct. 19, 1981, Ser. No. 312,681
Claims priority, application France, Jun. 2, 1981, 338
Term of patent 14 years
U.S. Cl. D9—378

277,079
BOTTLE OR SIMILAR ARTICLE
Veli T. Wirkkala, Helsinki, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland
Filed Sep. 20, 1982, Ser. No. 420,373
Claims priority, application Finland, Sep. 1, 1982, 744/82
Term of patent 14 years
U.S. Cl. D9—378

277,080
PORTABLE HANDLE FOR FLANGED-NECK CONTAINERS
Paul L. Gagnon, 5540 W. 5th, #105, Oxnard, Calif. 93030
Filed Jan. 21, 1983, Ser. No. 440,459
Term of patent 14 years
U.S. Cl. D9—434

277,081
WATCH
Edward B. Harvey, Chattanooga, Tenn., assignor to E. B. Harvey & Co., Chattanooga, Tenn.
Filed Sep. 17, 1982, Ser. No. 419,509
Term of patent 14 years
U.S. Cl. D10—33

277,082
EDGE FINDER
Ibrahim Ibrahimpasic, 1566 Scott St., San Jose, Calif. 95126
Filed Aug. 19, 1982, Ser. No. 409,573
Term of patent 14 years
U.S. Cl. D10—61

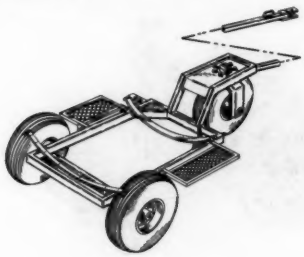


277,083
EDGE FINDER
Ibrahim Ibrahimpasic, 1566 Scott St., San Jose, Calif. 95126
Filed Aug. 19, 1982, Ser. No. 409,575
Term of patent 14 years
U.S. Cl. D10—61

277,084
VACUUM TESTING DEVICE FOR SEALED CONTAINERS
Glen C. Jackson, 16430 - 236th SE., Issaquah, Wash. 98026
Filed Jun. 1, 1982, Ser. No. 383,708
Term of patent 14 years
U.S. Cl. D10—83

277,085
JEWELRY SETTING
William C. Liebrick, Warwick, and Charles A. Morvillo, East Greenwich, both of R.I., assignors to Lee's Manufacturing Company, Inc., North Providence, R.I.
Filed Sep. 27, 1982, Ser. No. 425,551
Term of patent 14 years
U.S. Cl. D11—92

277,086
THREE-WHEELED TRAILER
Wayne C. Dudley, Parkersburg, Iowa 50665
Filed Feb. 24, 1982, Ser. No. 351,956
Term of patent 14 years
U.S. Cl. D12—101

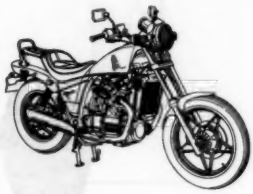


277,087
SNACK WAGON
Larry M. Fisher, Marietta, Ga., assignor to Carolyn P. Fisher, Moultrie, Ga.
Filed Jul. 12, 1982, Ser. No. 397,565
Term of patent 14 years
U.S. Cl. D12—102

277,088
MOTOR-FOUR-WHEELER CYCLE
Tsuyoshi Murakami, Shizuoka, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan
Filed May 26, 1982, Ser. No. 382,304
Claims priority, application Japan, Dec. 25, 1981, 56-58831
Term of patent 14 years
U.S. Cl. D12—107

277,089
HAND PROPELLED CHILD'S VEHICLE
Luigi Tosti, 2363 Parent St., Windsor, Ontario, Canada N8W 2E6
Filed Sep. 27, 1982, Ser. No. 424,546
Claims priority, application Canada, Sep. 22, 1982, 22-09-82-4
Term of patent 14 years
U.S. Cl. D12—107

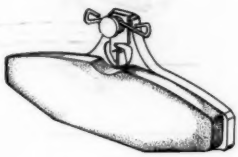
277,090
MOTORCYCLE
Masato Iwakura; Yasuaki Ohshima, both of Asaka, and Masamoto Ito, Komae, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 17, 1982, Ser. No. 450,729
Claims priority, application Japan, Jun. 22, 1982, 57-28085
Term of patent 14 years
U.S. Cl. D12—110



277,091
TIRE FOR A VEHICLE WHEEL
Nobuyuki Sakaki, Akashi, Japan, assignor to Dunlop Limited, London, England
Filed Jul. 19, 1982, Ser. No. 399,964
Claims priority, application Japan, Feb. 8, 1982, 57-5043
Term of patent 14 years
U.S. Cl. D12—136

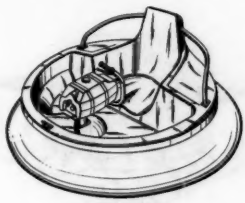
277,092
VEHICLE TIRE
Hideaki Nagayasu, Kakogawa, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Jul. 13, 1982, Ser. No. 397,868
Term of patent 14 years
U.S. Cl. D12—146

277,093
DISC BRAKE PAD UNIT
Dimitri Caplygin, Sydney, Australia, assignor to Girlock Limited, Belmore, Australia
Filed Mar. 30, 1982, Ser. No. 363,482
Term of patent 14 years
U.S. Cl. D12—180

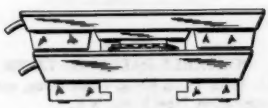


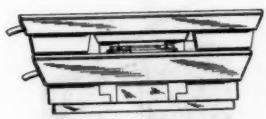
277,094
WHEEL COVER
Yung T. Hsieh, No. 2-16, Long Tran Village, Yung Kang Shing, Tainan, Taiwan
Filed Dec. 28, 1982, Ser. No. 454,023
Term of patent 14 years
U.S. Cl. D12—209

277,095
MOTORIZED BUMPER BOAT
Ralph V. Ball, Laguna Niguel, and John E. Pape, El Cajon, both of Calif., assignors to J & J Recreation, Inc., San Juan Capistrano, Calif.
Filed May 20, 1982, Ser. No. 380,122
Term of patent 14 years
U.S. Cl. D12—307

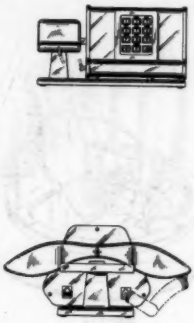


277,096
TELEPHONE
Myra Winkler, West Hartford, Conn., assignor to Teleconcepts, Inc., West Hartford, Conn.
Continuation-in-part of Ser. No. 337,470, Jan. 6, 1982,. This application Mar. 15, 1982, Ser. No. 358,422
Term of patent 14 years
U.S. Cl. D14—53

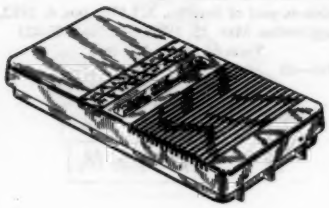




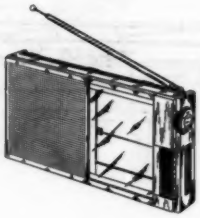
277,097
COMBINED TELEPHONE AND STAND THEREFOR
Myra Winkler, Hartford, Conn., assignor to Teleconcepts, Inc., West Hartford, Conn.
Filed Sep. 27, 1982, Ser. No. 424,450
Term of patent 14 years
U.S. Cl. D14—53



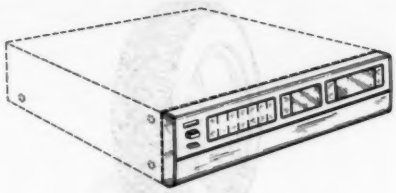
277,098
RADIO
Andrew Mark, Stamford, Conn., assignor to Salton, Inc., North Chicago, Ill.
Filed Apr. 9, 1984, Ser. No. 598,513
Term of patent 14 years
U.S. Cl. D14—68

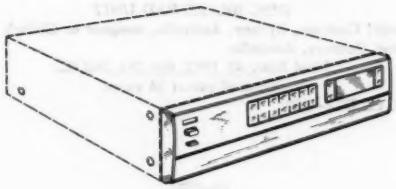


277,099
PORTABLE RADIO RECEIVER
Dieudonne G. Aoljs, Hong Kong, Hong Kong, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 22, 1982, Ser. No. 401,054
Claims priority, application United Kingdom, Feb. 2, 1982, 1004912
Term of patent 14 years
U.S. Cl. D14—71

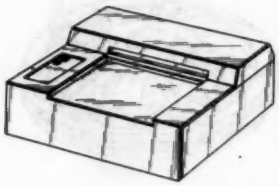


277,100
RECEIVER FRONT PANEL ASSEMBLY
Hari Matsuda, Evanston; Anthony J. Cascarano, Lake Forest, and Charles M. Schwimmer, Chicago, all of Ill., assignors to International Jensen Incorporated, Schiller Park, Ill.
Filed Jun. 2, 1982, Ser. No. 384,402
Term of patent 14 years
U.S. Cl. D14—76

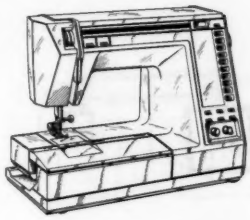




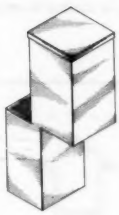
277,101
READER FOR IMAGE INFORMATION STORING/RETRIEVING MACHINE
Kunio Hara, Chiba, and Shigeki Yasutani, Kashiwa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Jul. 2, 1982, Ser. No. 394,614
Claims priority, application Japan, Jan. 7, 1982, 57-00087
Term of patent 14 years
U.S. Cl. D14—107



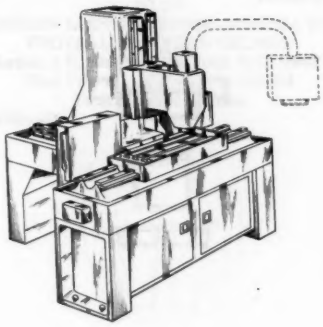
277,102
SEWING MACHINE
Nobufusa Kuroki, Machida, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan
Filed Apr. 8, 1981, Ser. No. 252,127
Term of patent 14 years
U.S. Cl. D15—70



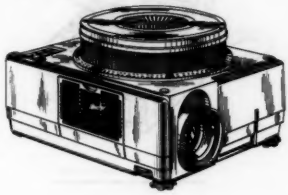
277,103
ICE MAKING MACHINE
Wayne H. Ripley, P.O. Box 2666, San Angelo, Tex. 76902
Filed Jun. 7, 1982, Ser. No. 386,207
Term of patent 14 years
U.S. Cl. D15—80



277,104
BED-TYPE MILLING MACHINE
Gerald V. Roch, Indianapolis, Ind., assignor to Hurco Manufacturing Co., Inc., Indianapolis, Ind.
Filed Nov. 8, 1982, Ser. No. 440,010
Term of patent 14 years
U.S. Cl. D15—131



277,105
COMBINED SLIDE PROJECTOR AND SLIDE MAGAZINE
Kenneth Österlin, Nordhemsgatan 74, S-413 09 Göteborg, Sweden
Filed Dec. 7, 1982, Ser. No. 447,533
Claims priority, application Sweden, Jun. 30, 1982, 82-1744
Term of patent 14 years
U.S. Cl. D16—21

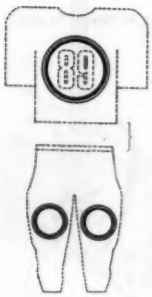


277,106
GUITAR
William H. Edwards, 8890 56th St., Temple Terrace, Fla. 33617
Filed Jul. 30, 1982, Ser. No. 403,344
Term of patent 14 years
U.S. Cl. D17—18

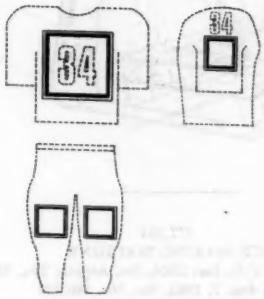
277,107
CASH REGISTER
Junichi Sakamoto, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Apr. 5, 1983, Ser. No. 482,317
Claims priority, application Japan, Oct. 5, 1982, 57-45649
Term of patent 14 years
U.S. Cl. D18—4

277,108
CIRCULAR SLIDE RULE
Lynn Lundquist, 10833 NE. Russell St., Portland, Oreg. 97220
Filed Sep. 30, 1982, Ser. No. 431,742
Term of patent 14 years
U.S. Cl. D18—10

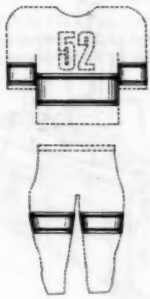
277,109
POSITION IDENTIFICATION INSIGNIA FOR FOOTBALL PLAYER'S UNIFORM
Ramon Gordon, 3 E. 10th St., New York, N.Y. 10003
Filed Feb. 17, 1982, Ser. No. 349,638
Term of patent 14 years
U.S. Cl. D20—11



277,110
POSITION IDENTIFICATION INSIGNIA FOR FOOTBALL PLAYER'S UNIFORM
Ramon Gordon, 3 E. 10th St., New York, N.Y. 10003
Filed Feb. 17, 1982, Ser. No. 349,639
Term of patent 14 years
U.S. Cl. D20—11



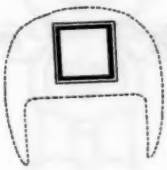
277,111
POSITION IDENTIFICATION INSIGNIA FOR FOOTBALL PLAYER'S UNIFORM
Ramon Gordon, 3 E. 10th St., New York, N.Y. 10003
Filed Feb. 17, 1982, Ser. No. 349,641
Term of patent 14 years
U.S. Cl. D20—11



277,112
POSITION IDENTIFICATION INSIGNIA FOR FOOTBALL PLAYER'S HELMET
Ramon Gordon, 3 E. 10th St., New York, N.Y. 10003
Filed Feb. 17, 1982, Ser. No. 349,642
Term of patent 14 years
U.S. Cl. D20—11

277,113
POSITION IDENTIFICATION INSIGNIA FOR FOOTBALL PLAYER'S HELMET
Ramon Gordon, 3 E. 10th St., New York, N.Y. 10003
Filed Feb. 17, 1982, Ser. No. 349,643
Term of patent 14 years
U.S. Cl. D20—11

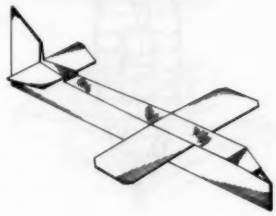
277,114
POSITION IDENTIFICATION INSIGNIA FOR FOOTBALL PLAYER'S HELMET
Ramon Gordon, 3 E. 10th St., New York, N.Y. 10003
Filed Feb. 17, 1982, Ser. No. 349,644
Term of patent 14 years
U.S. Cl. D20—11



277,115
SPECTACLE TAG
Norman Liebman, Livingston, N.J., assignor to Arch Crown Tags, Inc., Newark, N.J.
Filed Nov. 24, 1980, Ser. No. 209,506
Term of patent 14 years
U.S. Cl. D20—27

277,116
TOY VEHICLE
Joseph E. Johnston, San Rafael, Calif., assignor to Lucasfilm, Ltd., San Rafael, Calif.
Filed Sep. 30, 1982, Ser. No. 429,767
Term of patent 14 years
U.S. Cl. D21—87

277,117
KITE PLANE
Bernard R. Barrett, 308 Graham Ave., Lombard, Ill. 60148
Filed Oct. 27, 1982, Ser. No. 437,036
Term of patent 14 years
U.S. Cl. D21—89



277,118
TOY CIRCULAR SAW
Ronald R. Klawitter, Hermann, Mo., assignor to Handi-Pac, Inc., Hermann, Mo.
Filed May 24, 1982, Ser. No. 381,073
Term of patent 14 years
U.S. Cl. D21—120

277,119
TOY HAMMER
Terry Paczko, Cleveland, Ohio, assignor to Questor Corp., Tampa, Fla.
Filed Sep. 30, 1982, Ser. No. 431,367
Term of patent 14 years
U.S. Cl. D21—120

277,120
TOY VEHICLE
Joseph E. Johnston, San Rafael, Calif., assignor to Lucas Film, Ltd., San Rafael, Calif.
Filed Sep. 30, 1982, Ser. No. 429,774
Term of patent 14 years
U.S. Cl. D21—130

277,121
TOY BEAR FIGURE
Ralph Shaffer, Columbia Station, and William Davidson, Lakewood, both of Ohio, assignors to American Greetings Corporation, Cleveland, Ohio
Filed Oct. 14, 1982, Ser. No. 434,207
Term of patent 14 years
U.S. Cl. D21—159

277,122
TOY BEAR FIGURE
Ralph Shaffer, Columbia Station, and William Davidson, Lakewood, both of Ohio, assignors to American Greetings Corporation, Cleveland, Ohio
Filed Oct. 14, 1982, Ser. No. 434,208
Term of patent 14 years
U.S. Cl. D21—159

277,123
TOY BEAR FIGURE
Ralph Shaffer, Columbia Station, and William Davidson, Lakewood, both of Ohio, assignors to American Greetings Corporation, Cleveland, Ohio
Filed Oct. 14, 1982, Ser. No. 434,209
Term of patent 14 years
U.S. Cl. D21—159

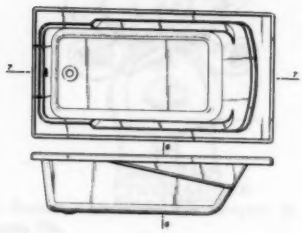
277,124
TOY BEAR FIGURE
Ralph Shaffer, Columbia Station, and William Davidson, Lakewood, both of Ohio, assignors to American Greetings Corporation, Cleveland, Ohio
Filed Oct. 14, 1982, Ser. No. 434,210
Term of patent 14 years
U.S. Cl. D21—59

277,125
TOY BEAR FIGURE
Ralph Shaffer, Columbia Station, and William Davidson, Lakewood, both of Ohio, assignors to American Greetings Corporation, Cleveland, Ohio
Filed Oct. 14, 1982, Ser. No. 434,211
Term of patent 14 years
U.S. Cl. D21—159

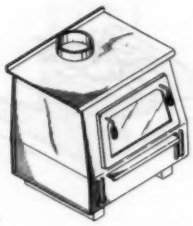
277,126
THIN FLAT SIDED HAND HELD WEAPON
Jody L. Numbers, 7908 E. Oak, Scottsdale, Ariz. 85257
Filed Aug. 9, 1982, Ser. No. 406,396
Term of patent 14 years
U.S. Cl. D22—1

277,127
TURRET TOP SPRINKLER
Spencer L. Mackay, North Hollywood; Cleophus Price, Jr., Monrovia, and Harold F. Fechtner, Claremont, all of Calif., assignors to Rain Bird Consumer Products Mfg. Corp., Duarte, Calif.
Filed Jan. 28, 1982, Ser. No. 343,463
Term of patent 14 years
U.S. Cl. D23—7

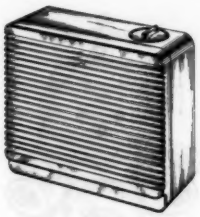
277,128
BATHTUB
Phillip D. Daniels, 4797 Lake Bluff, West Bloomfield Township, Mich. 38033
Filed Dec. 8, 1982, Ser. No. 447,952
Term of patent 14 years
U.S. Cl. D23—55



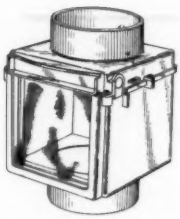
277,129
WOOD BURNING STOVE
Donavan R. Larson; Herbert A. F. Larson, and Gregory A. Larson, all of 31087 Peardonville Rd., #C, RR7, Abbotsford, British Columbia, Canada V2S 5W6
Filed Feb. 17, 1981, Ser. No. 234,679
The portion of the term of this patent subsequent to Oct. 8, 2007, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—97



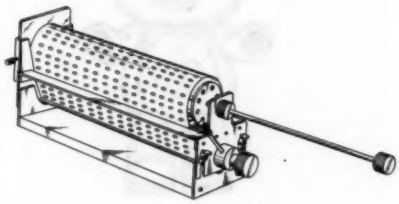
277,130
FAN-FORCED HEATER
Hans U. Schade, Neu-Ulm, Fed. Rep. of Germany, assignor to Elektro-Warmetechnik Siegfried Petz Co., Fed. Rep. of Germany
Filed Mar. 17, 1982, Ser. No. 359,178
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, MR VI532
Term of patent 14 years
U.S. Cl. D23—122



277,131
HOUSING FOR A CLOTHES DRYER VENT
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Sep. 5, 1980, Ser. No. 184,732
Term of patent 14 years
U.S. Cl. D23—151



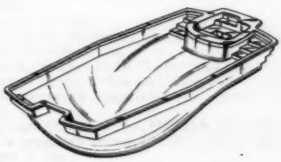
277,132
SMALL ANIMAL HOLDER FOR USE WITH APPARATUS MEASURING BLOOD PRESSURE OF SMALL ANIMAL
Yoshimoto Hayashi; Atsuhiro Harima, and Tsune Tajima, all of Kawasaki, Japan, assignors to Hayashi Denki Co., Ltd., Kawasaki, Japan
Filed Apr. 8, 1982, Ser. No. 366,572
Claims priority, application Japan, Oct. 21, 1981, 56-46752
Term of patent 14 years
U.S. Cl. D24—8



277,133
DIGITAL SPHYGMOMANOMETER
John T. Houlihan, Watertown, Conn., assignor to Timex Medical Products Corporation, Waterbury, Conn.
Filed Oct. 12, 1982, Ser. No. 433,947
Term of patent 14 years
U.S. Cl. D24—17

277,134
DENTAL SYRINGE
William B. Dragan, Burr St., RFD #1, Fairfield, Conn. 06430
Filed Nov. 6, 1981, Ser. No. 319,041
Term of patent 14 years
U.S. Cl. D24—24

277,135
COMBINATION FIBERGLASS SWIMMING POOL AND SPA
George P. Sullivan, P.O. Box 652, Hemet, Calif. 92343
Filed Nov. 15, 1982, Ser. No. 441,665
Term of patent 14 years
U.S. Cl. D24—38



277,136
BARBECUE STAND OR THE LIKE
Stijn Van der Upwich, Hamlaan 3, Vleuten, Netherlands
Filed Apr. 13, 1982, Ser. No. 367,835
Claims priority, application Netherlands, Oct. 13, 1981, 08965
Term of patent 14 years
U.S. Cl. D25—1

277,137
BARBECUE STAND OR THE LIKE
Stijn Van der Upwich, Hamlaan 3, Vleuten, Netherlands
Filed Apr. 13, 1982, Ser. No. 368,058
Claims priority, application Netherlands, Oct. 13, 1981, 0896501
Term of patent 14 years
U.S. Cl. D25—1

277,138
SCREEN DOOR
Paul E. Hostetler, 3545 Hacienda St., Sarasota, Fla. 33578
Filed Oct. 13, 1982, Ser. No. 434,108
Term of patent 14 years
U.S. Cl. D25—49

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TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF JANUARY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Niro Atomizer: *See*—
Jensen, Uffe L.; and Mortensen, Sten, 4,492,040, Cl. 34-10.000.

AB Nordstroms Linbanor: *See*—
Svens, Runar, 4,492,302, Cl. 198-671.000.

Abbott Laboratories: *See*—
Wang, Chao-Huei J.; Stroupe, Stephen D.; and Jolley, Michael E., 4,492,762, Cl. 436-537.000.

Abe, Kiyomi, to Pentel Kabushiki Kaisha. Tablet input apparatus. 4,492,818, Cl. 178-18.000.

Abe, Kohichiroh: *See*—
Suda, Kenichi; Tamaki, Katsuyuki; Tateishi, Kazushi; and Abe, Kohichiroh, 4,492,994, Cl. 360-85.000.

Abell, R. Bruce, to Refractory Poroducts Co. Electric furnace insulation. 4,493,089, Cl. 373-130.000.

Abitz, Ronald E.: *See*—
Ware, Warren O.; Borst, Gary M.; and Abitz, Ronald E., 4,492,169, Cl. 108-6.000.

Abrahamson, Daniel P.: *See*—
Thomas, Paul M.; and Abrahamson, Daniel P., 4,492,503, Cl. 414-152.000.

Abramo, Aina L.: *See*—
Bjork, Anders K.; Abramo, Aina L.; and Christensson, Erik G., 4,492,698, Cl. 424-250.000.

Ackermann, Keith A.: *See*—
Schoenheimer, Marcus F.; Gaskell, Lionel A.; and Ackermann, Keith A., 4,492,219, Cl. 126-427.000.

Acorn Engineering Company: *See*—
Morris, Earl L.; Hafner, V. Walter; and Hahn, Ron T., 4,492,430, Cl. 350-631.000.

Actrol Industries Pty. Ltd.: *See*—
Schoenheimer, Marcus F.; Gaskell, Lionel A.; and Ackermann, Keith A., 4,492,219, Cl. 126-427.000.

Adachi, Takao: *See*—
Uchida, Tetsue; and Adachi, Takao, 4,492,218, Cl. 126-96.000.

Adachi, Tomomichi, to Fujitsu Limited. Belt synchronous check system for a line printer. 4,493,084, Cl. 371-67.000.

Adam, Fritz G., to ITT Industries, Inc. Integrated circuit for writing, reading and erasing memory matrices with insulated-gate field-effect transistors having non-volatile storage behaviour. 4,493,058, Cl. 365-189.000.

Adams, Tello D., to GTE Automatic Electric, Inc. Interface circuit for digital signal transmission system. 4,493,092, Cl. 375-36.000.

ADIR: *See*—
Reginier, Gilbert; Laubie, Michel; and Duhault, Jacques, 4,492,696, Cl. 424-249.000.

Adolphi, Heinrich: *See*—
Rieber, Norbert; Boehm, Heinrich; and Adolphi, Heinrich, 4,492,689, Cl. 424-200.000.

Advance Process Supply Co.: *See*—
Green, Melvin E., 4,492,486, Cl. 401-131.000.

Adzima, Leonard J.: *See*—
Ritter, George W., II; and Adzima, Leonard J., 4,492,722, Cl. 427-226.000.

AE PLC: *See*—
Martin, H. Woods, 4,492,631, Cl. 210-127.000.

Agence Nationale de Valorisation de la Recherche: *See*—
Bourdet, Gilbert L.; and Franco, Michel A., 4,492,464, Cl. 356-4.500.

Agency of Industrial Science & Technology: *See*—
Tajima, Michio, 4,492,871, Cl. 250-459.100.
Watanabe, Tadahiko; Tsuya, Yuko; and Enomoto, Yuji, 4,492,764, Cl. 501-87.000.

Agers, Brian M.; and Goldstein, Arnold S., to Du Pont de Nemours, E. I., and Company. Yarn texturing jet. 4,492,009, Cl. 28-254.000.

Agfa-Gevaert AG: *See*—
Bickl, Horst; Findeis, Gunter; and Treiber, Helmut, 4,492,458, Cl. 355-38.000.

AGFA-Gevaert N.V.: *See*—
Vackier, Leo N.; Mampaey, Jozef L.; and Alaerts, Leo B., 4,492,177, Cl. 118-651.000.

Agrawal, Anil K.; Mullen, Philip G.; and Vadakan, Vivatvong V., to United States of America, National Aeronautics and Space Administration. Multicomputer communication system. 4,493,021, Cl. 364-200.000.

Agrawal, Vishwani D.; and Mercer, Melvin R., to AT&T Laboratories. Scan testable integrated circuit. 4,493,077, Cl. 371-25.000.

Ahlstrom, John K.: *See*—
Gavrin, Edward S.; Bratt, Richard G.; Schleimer, Stephen I.; Pilat, John F.; Richmond, Michael S.; Wallach, Walter A., Jr.; Belgard, Richard A.; Farber, David A.; Ahlstrom, John K.; Wallach, Steven J.; Clancy, Gerald F.; Mundie, Craig J.; Jones, Thomas M.; Bachman, Brett L.; and Bernstein, David H., 4,493,023, Cl. 364-200.000.
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Air Products and Chemicals, Inc.: *See*—
O'Reilly, Richard, 4,492,591, Cl. 62-17.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Kozakai, Asao; Watanabe, Shingo; and Nakanishi, Nobuyasu, 4,492,414, Cl. 303-116.000.

Aisin Warner Kabushiki Kaisha: *See*—
Ito, Yasunobu, 4,492,421, Cl. 339-59.00R.

Akazawa, Hiroyuki; and Yoshiie, Kazue, to Epson Corporation; Okaya Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Suwa Seikosha. Improved ribbon mask and guide for wire dot printers. 4,492,484, Cl. 400-248.000.

Akimoto, Masao: *See*—
Hayakawa, Daishiro; Akimoto, Masao; Narita, Katsumi; and Tani, Kenroku, 4,492,928, Cl. 330-126.000.

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Vackier, Leo N.; Mampaey, Jozef L.; and Alaerts, Leo B., 4,492,177, Cl. 118-651.000.

Albarello, Alain; Roullet, Andre ; and Pimentel, Alberto, to Thomson-CSF. Fractional-division frequency synthesizer for digital angle-modulation. 4,492,936, Cl. 332-19.000.

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Alderman, Robert J. Telephone hold circuit with improved self-limiting amplifier for injecting an audio signal during hold conditions. 4,492,822, Cl. 179-81.00R.

Alexander, Billy R., to United States of America, Navy. Jet engine compressor stage puller. 4,492,014, Cl. 29-259.000.

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Alfa Romeo Auto S.p.A.: *See*—
Radaelli, Dario, 4,492,201, Cl. 123-470.000.

Allan, David E., to Exxon Research and Engineering Co. Delayed coking process with split fresh feed. 4,492,625, Cl. 208-131.000.

Allbright, Charles T.; and Culp, Dennis S., to Avery International Corp. Humidity-resistant wet-stick adhesives. 4,492,724, Cl. 428-40.000.

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Allen Industries, Inc.: *See*—
Lohr, Thomas E., 4,492,408, Cl. 297-344.000.

Allen, John H.: *See*—
Johnson, Gerald L.; Nolting, Eugene C.; and Allen, John H., 4,492,161, Cl. 101-109.000.

Allenbaugh, Howard M., to M.A.G. Engineering & Manufacturing Co., Inc. Adjustable strike. 4,492,397, Cl. 292-341.180.

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Cooke, Robert S., 4,492,788, Cl. 525-410.000.
Ficken, William; Sears, Jerome; and Parfomak, Walter, 4,492,902, Cl. 318-254.000.
Ray, Valton O.; Roeland, Robert H.; Potter, Carl H.; and Szmuilowicz, Yehuda I., 4,492,557, Cl. 425-72.00S.

Altman, Daniel E.: *See*—
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LeFebvre, Jacques, 4,492,615, Cl. 204-28.000.

Alzeta Corporation: *See*—
Kendall, Robert M.; Schreiber, Richard J.; and Kesselring, John P., 4,492,185, Cl. 122-32.000.

Am Fab, Inc.: *See*—
Solomon, Robert A., 4,492,170, Cl. 108-148.000.

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AMCA International Corporation: *See*—
Weingart, Brooks E., 4,492,310, Cl. 212-191.000.

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Kallai-Sanfacon, Mary-Ann, 4,492,706, Cl. 424-270.000.
Sarantakis, Dimitrios, 4,492,651, Cl. 260-112.50S.

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Simovits, Stephen S., Jr., 4,492,950, Cl. 338-162.000.

American Safety Equipment Corporation: *See*—
Stamboulian, Nazareth, 4,492,349, Cl. 242-107.40A.
Ziv, Avraham; and Tanaka, Akira, 4,492,348, Cl. 242-107.200.

Amighini, Mario. Manually actuated hydraulic jack for compressively applying terminals on electric cables and conductors in general. 4,492,106, Cl. 72-453.020.

AMP Incorporated: *See—*
Fukukura, Kazutoyo, 4,492,838, Cl. 200-159.00A.

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Doninelli, Peter D., 4,492,035, Cl. 33-172.00B.

Anantha, Narasipur G.; Ning, Tak H.; and Tsang, Paul J., to International Business Machines Corporation. Methods for making high performance lateral bipolar transistors. 4,492,008, Cl. 29-571.000.

Anderson, Eric V.: *See—*
Prescott, Robert C.; Gold, Calman; and Anderson, Eric V., 4,492,246, Cl. 137-85.000.

Anderson, James M.; Knight, Thomas S., III; Kitagawa, Dennis T.; and Rey, Ernesto, to National Semiconductor Corporation. Self repairing bulk memory. 4,493,075, Cl. 371-10.000.

Anderson, Thomas E.; Bush, Alvin A.; and Giorgis, John, to General Electric Company. Stored charge inverter circuit. 4,492,881, Cl. 307-270.000.

Andou, Norio: *See—*
Goto, Tadahiko; Oniki, Kiyoshi; Murakami, Satoshi; Yokooji, Mitsunori; Andou, Norio; and Shimojyo, Norio, 4,492,906, Cl. 318-488.000.

Andrews, James B.: *See—*
Scarlet, Richard I.; Andrews, James B.; and Henning, William F., II, 4,492,963, Cl. 343-464.000.

Aneja, Viney P., to General Electric Company. Method for purification of bisphenol A. 4,492,807, Cl. 568-724.000.

Angelle, Phillip A.; Porter, Marion G.; and King, James L., to Honeywell Information Systems Inc. Apparatus and method for an operating system supervisor in a data processing system. 4,493,034, Cl. 364-200.000.

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Manderla, Henry J., 4,492,358, Cl. 249-18.000.

Anthony Manufacturing Corp.: *See—*
Lockwood, George H., 4,492,247, Cl. 137-119.000.

Antoni, Herbert, to Paul Forkardt GmbH & Co, KG. Method and apparatus for determining the working range of a double-acting clamping cylinder for actuating chucking devices on machine tools. 4,493,041, Cl. 364-474.000.

Aoki, Fujio; and Isobe, Hiroshi, to Diesel Kiki Co., Ltd. Fuel cut-off device for fuel injection pumps for multi-cylinder internal combustion engines. 4,492,191, Cl. 123-198.00F.

Aoki, Katsumichi; Kanda, Yoichi; Satake, Keigo; and Shinkawa, Hiroyasu, to Kureha Kagaku Kogyo Kabushiki Kaisha. 1,5-Diphenyl derivative of 1,2,4-triazole-3-carboxamide and herbicide containing the same. 4,492,597, Cl. 71-92.000.

Aoki, Masahiro: *See—*
Oinoue, Kenichi; Hayashi, Asao; Nakamura, Junichi; Ida, Masatoshi; Aoki, Masahiro; and Fukuoka, Kenji, 4,492,449, Cl. 354-407.000.

Aoki, Toru: *See—*
Yamamoto, Takeshi; Suzuki, Norihito; Aoki, Toru; and Iwaki, Akio, 4,492,740, Cl. 428-629.000.

Aono, Yukio: *See—*
Ozawa, Isao; Aono, Yukio; and Ueno, Masato, 4,492,366, Cl. 267-140.100.

Apollo Chemical Corporation: *See—*
Jenkins, Evans M., 4,492,584, Cl.

Apothaker, Richard L.; Reed, James; rmen L.; and Wagner, Frederick B., III, to Kontes Glass Con., lass captivated heating unit for still or the like. 4,492,951, Cl. 33[illegible]-516.000.

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Applied Magnetics Corporation: *See—*
Martin, Richard T., 4,492,180, Cl. 118-704.000.

Aquaris Industries, Incorporated: *See—*
Robinson, Thomas D.; Sharp, Lewis A., Jr.; and McAllister, George P., 4,491,990, Cl. 4-607.000.

Aragaki, Takehiko: *See—*
Nakasone, Seiken; Miyagi, Sadao; Aragaki, Takehiko; and Higa, Yasusi, 4,492,601, Cl. 127-48.000.

Araghi, Mehdi N.: *See—*
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Sato, Masato; Kataoka, Hiroyuki; and Arai, Yoshio, 4,492,985, Cl. 358-293.000.

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Graas, Rene ; and Fackelstein, Michel, 4,492,022, Cl. 29-787.000.

Arcair Company: *See—*
Delius, Henry B., 4,492,841, Cl. 219-69.00R.

Arff, Heino, to ITW Ateco GmbH. Cleat for sports shoes. 4,492,047, Cl. 36-134.000.

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Chinn, Bryan P.; Armour, John S.; Watson, Peter M. F.; and Donne, Graham L., 4,492,244, Cl. 137-38.000.

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Faure, Jean-Louis, 4,492,075, Cl. 57-5.000.

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Brogardh, Torgny; Linge, Anders; and Sander, Lars, 4,492,860, Cl. 250-227.000.

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Mansour, Maher L., 4,492,041, Cl. 34-15.000.

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Aspnes, David E., 4,492,466, Cl. 356-334.000.
Bean, John C.; Chiu, Kin-Chung R.; and Poate, John M., 4,492,971, Cl. 357-15.000.
Bell, Steve W.; and Embree, Milton L., 4,492,824, Cl. 179-81.00B.
Bergmann, Ernest E., 4,492,436, Cl. 350-395.000.
Brzezinski, Alex M.; Hershey, Harold J.; and Whitesell, Stephen R., 4,492,825, Cl. 179-111.00R.
Colbert, Raymond O.; and Hellman, Bengt H., 4,492,876, Cl. 307-66.000.
Finegan, Sean N.; McFee, James H.; and Swartz, Robert G., 4,492,852, Cl. 219-405.000.
Fleischer, Paul E.; Ganesan, Apparajan; and Laker, Kenneth R., 4,492,935, Cl. 331-135.000.
Forrest, Stephen R.; and Panock, Richard L., 4,493,113, Cl. 455-606.000.
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Marcuse, Dietrich; and Presby, Herman M., 4,492,463, Cl. 356-73.100.
Silverio, Vincent J., 4,493,031, Cl. 364-200.000.
Thierbach, Mark E., 4,493,029, Cl. 364-200.000.
Thompson, Dennis J., 4,493,053, Cl. 364-900.000.
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Witmore, Ronald K.; and Zelenski, Jerome J., 4,493,073, Cl. 370-14.000.

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Agrawal, Vishwani D.; and Mercer, Melvin R., 4,493,077, Cl. 371-25.000.
Kaplan, Martin L., 4,492,652, Cl. 568-75.000.

Atkinson, Ivor B.; and Holdstock, Barry C., to CooperVision, Inc. Hydrogel contact lenses for permanent wear. 4,492,776, Cl. 523-108.000.

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Tanner, David P., 4,492,736, Cl. 428-446.000.
Yoo, Jin S.; and Radlowski, Cecelia A., 4,492,677, Cl. 423-244.000.
Yoo, Jin S.; and Radlowski, Cecelia A., 4,492,678, Cl. 423-244.000.

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Miller, Albert J., 4,492,952, Cl. 340-52.00F.

Aude, Thomas C., to Bechtel International Corporation. Apparatus and method for slack flow elimination in a slurry pipeline. 4,492,248, Cl. 137-236.00R.

Auer, Werner, to Teldix GmbH. Flywheel. 4,492,131, Cl. 74-574.000.

Augusta Developments Inc.: *See—*
Hanson, Gustaf H., 4,492,573, Cl. 433-11.000.

Austpole Pty., Ltd.: *See—*
Arnold, Victor, 4,492,496, Cl. 405-303.000.

Autelca AG: *See—*
Dubey, Pierre, 4,492,296, Cl. 194-100.00A.

Auth, David C. Non-sticking electrocautery system and forceps. 4,492,231, Cl. 128-303.170.

Averbuch, Marie-Therese; Durif-Varambon, Andre ; Gauthier, Sylviane; Nicolau, Ion F.; and Peuzin, Jean C., to Commissariat a l'Energie Atomique. Pyroelectric detector and vidicon. 4,492,857, Cl. 250-211.00R.

Avery, Carl F., to Marion Laboratories, Inc. Package for collecting cultures. 4,492,305, Cl. 206-210.000.

Avery International Corp.: *See—*
Allbright, Charles T.; and Culp, Dennis S., 4,492,724, Cl. 428-40.000.

Avery, Randall N., to Westinghouse Electric Corp. Reinforced tank wall structure for transformers. 4,492,314, Cl. 220-71.000.

Awerkamp, John B. Fluid-operated oil or water well pump. 4,492,537, Cl. 417-404.000.

Ayerst, McKenna & Harrison, Inc.: *See—*
Gauthier, Jean A.; and Jirkovsky, Ivo L., 4,492,697, Cl. 424-248.400.

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Bynoe, Robert J., 4,492,064, Cl. 52-309.800.
Wootton, Gerald V., 4,492,613, Cl. 203-39.000.

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McLeod, Alasdair D., 4,492,299, Cl. 198-417.000.

Babcock, Ernest R. Buffing pad retainer. 4,491,999, Cl. 15-230.000.

Babcock & Wilcox Company, The: *See—*
Hammond, Charles W., 4,492,187, Cl. 122-390.000.
Pocock, Robert E., 4,492,559, Cl. 431-12.000.

Babies by Storm, Inc.: *See—*
Storm, Linda W., 4,492,326, Cl. 224-160.000.

Bachman, Brett L.; Nealon, James T.; and Young, Charles J., to Data General Corporation. Digital data processing system using unique means for comparing operational results and locations at which such results are to be stored. 4,493,025, Cl. 364-200.000.

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Baile, George H ; and Johnson, John J., to SKF Industries, Inc. Unitary full complement bearing components containing rolling elements in a self-supporting lubricating matrix. 4,492,415, Cl. 384-463.000.

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Watson, James M.; and Bailey, Darrell E., 4,492,675, Cl. 422-187.000.

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Bakker, William J. Paper roll rewinder. 4,492,345, Cl. 242-67.30R.

Baldwin, Jeffrey D., to Sundstrand Corporation. Compact resistor assembly for rotary electric machine. 4,492,887, Cl. 310-68.00R.

Ball, David C., to W. W. Sly Manufacturing Co., The. Bulk conveyor apparatus. 4,492,294, Cl. 193-25.00C.

Ball, William J.; Cotton, Leonard; and Stewart, David G., to British Petroleum Company Limited, The. Process for the production of oxygenated hydrocarbons by the catalytic conversion of synthesis gas. 4,492,772, Cl. 518-713.000.

Ball, William J.; Cotton, Leonard; and Stewart, David G., to British Petroleum Company Limited, The. Process for the production of C_1 to C_4 oxygenated hydrocarbons by the catalytic conversion of synthesis gas. 4,492,773, Cl. 518-713.000.

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Hunt, Donald E., 4,492,210, Cl. 123-568.000.

Balzeit, Ralf: *See—*
Dinse, Wolfgang; Balzeit, Ralf; and Gesell, Reinhard, 4,492,984, Cl. 358-289.000.

BancTec, Incorporated: *See—*
Johnson, Gerald L.; Nolting, Eugene C.; and Allen, John H., 4,492,161, Cl. 101-109.000.

Bangerter, Richard M.: *See—*
Kennard, Lon H.; Hall, Duane O.; and Bangerter, Richard M., 4,492,820, Cl. 179-5.00P.

Bankar, Vilas G.; Stuchlik, Terry L.; and Werny, Frank, to Du Pont de Nemours, E. I., and Company. Trilobal filaments exhibiting high bulk and sparkle. 4,492,731, Cl. 428-362.000.

Bannerman, Wyburn G.; and Ludwig, Charles H., to Georgia-Pacific Corporation. Cohesive fibrous mat for in-transit particulate control. 4,492,729, Cl. 428-283.000.

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Bar, Alfredo, to Necchi Societa per Azioni. Starting relay-terminal box group for hermetic motor-driven compressors. 4,492,886, Cl. 310-68.00C.

Barclay, John L.; Brooks, Alan G.; and Duebel, Clive P. J., to British Petroleum Company p.l.c., The. Apparatus and method for transferring solids. 4,492,497, Cl. 406-153.000.

Barnhart, Gerald K. Fish lure. 4,492,054, Cl. 43-42.230.

Barnum, Dean C.: *See—*
Campbell, Frank L.; Barnum, Dean C.; and Corea, William C., 4,492,275, Cl. 175-46.000.

Barone, Charles: *See—*
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Barry, Jurgen: *See—*
Pross, Wilhelm; Barry, Jurgen; Muhlbock, Franz; and Hartmann, Klaus, 4,492,462, Cl. 356-39.000.

Barry Wright Corporation: *See—*
Peterson, Robert R.; Schubert, Dale W.; and Cholakis, Peter N., 4,492,949, Cl. 338-114.000.

BASF Aktiengesellschaft: *See—*
Frank, Gerhard; Rudolf, Peter; Neubauer, Gerald; Duffner, Paul; Ohlinger, Manfred; Wilfinger, Hans J.; and Pfannebecker, Emil, 4,492,804, Cl. 564-493.000.
Rieber, Norbert; Boehm, Heinrich; and Adolphi, Heinrich, 4,492,689, Cl. 424-200.000.

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Batke, Manfred: *See—*
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Bauer, Klaus: *See—*
Willms, Lothar; Huttelmaier, Thomas; Mildenberger, Hilmar; Bauer, Klaus; Burstell, Helmut; and Bieringer, Hermann, 4,492,598, Cl. 71-93.000.

Baugh, Benton F. Valve assembly. 4,492,359, Cl. 251-1.00A.

Baumann, Fritz; Kranzler, Ernst; Radke, Siegmund; Schilling, Rainer; Fuchs, Wolfgang; and Rieker, Werner, to Robert Bosch GmbH. Fixture for a wire in a wire-winding device for an electric machine. 4,492,344, Cl. 242-1.000.

Baur, Karl; and Karwat, Heinz, to Linde Aktiengesellschaft. Process for preventing the plugging of installations with metallic sulfides. 4,492,676, Cl. 423-210.000.

Baxter, Ward, II; Clancy, Gerald F.; Gruner, Ronald H.; Mundie, Craig J.; Bachman, Brett L.; Redfield, Stephen R.; Coder, William N.; Jones, Thomas M.; Houseman, David L.; Young, Charles J.; and Haeffele, Steven M., to Data General Corporation. Digital data processing system. 4,493,024, Cl. 364-200.000.

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Claussen, Uwe, 4,492,648, Cl. 252-582.000.

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Brunn, Horst; Hund, Franz; Rambold, Wolfgang; Kresse, Peter; and von Szadkowski, Gerd, 4,492,600, Cl. 106-14.340.
Claussen, Uwe; Merten, Josef; Rohr, Harry; and Melchior, Bernd, 4,492,778, Cl. 523-137.000.
Goldmann, Siegfried; Boshagen, Horst; Stoltefuss, Jurgen; Schramm, Matthias; Thomas, Gunter; and Kazda, Stanislav, 4,492,703, Cl. 424-266.000.
Hohmann, Walter; and Wunderlich, Klaus, 4,492,790, Cl. 544-188.000.
Kramer, Wolfgang; Jautelat, Manfred; and Kranz, Eckart, 4,492,795, Cl. 548-341.000.
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Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, 4,492,800, Cl. 562-506.000.

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Kaufmann, Meinolph; and Schad, Hanspeter, 4,492,432, Cl. 350-338.000.

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Bean, John C.; Chiu, Kin-Chung R.; and Poate, John M., to AT&T Bell Laboratories. Metal silicide-silicon heterostructures. 4,492,971, Cl. 357-15.000.

Beatrice Foods Co.: *See—*
Cooper, Stephen E.; and Leohner, Donald L., 4,492,714, Cl. 426-602.000.

Bechtel International Corporation: *See—*
Aude, Thomas C., 4,492,248, Cl. 137-236.00R.

Beckwith, Walter L., Jr., to Brown & Sharp Manufacturing Company. Magnetic ball bar gauge. 4,492,036, Cl. 33-180.00R.

Beede Electrical Instrument Co., Inc.: *See—*
Reenstra, Arthur L., 4,492,920, Cl. 324-146.000.

Beerens, Cornelis J. M. Chain saw bars. 4,492,030, Cl. 30-384.000.

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Belart, Juan, to ITT Industries, Inc. Master cylinder for hydraulically actuated brakes for automotive vehicles. 4,492,082, Cl. 60-589.000.

Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; and Weise, Lutz, to ITT Industries, Inc. Control arrangement for an antiskid hydraulic braking system of a vehicle. 4,492,413, Cl. 303-92.000.

Belgard, Richard A.: *See*—
Gavrin, Edward S.; Bratt, Richard G.; Schleimer, Stephen I.; Pilat, John F.; Richmond, Michael S.; Wallach, Walter A., Jr.; Belgard, Richard A.; Farber, David A.; Ahlstrom, John K.; Wallach, Steven J.; Clancy, Gerald F.; Mundie, Craig J.; Jones, Thomas M.; Bachman, Brett L.; and Bernstein, David H., 4,493,023, Cl. 364-200.000.
Katz, Lawrence H.; Wells, Douglas M.; Richmond, Michael S.; Belgard, Richard A.; Wallach, Walter A., Jr.; Bernstein, David H.; Ahlstrom, John K.; Pilat, John F.; Farber, David A.; Bratt, Richard G.; and Bachman, Brett L., 4,493,027, Cl. 364-200.000.

Belknap, Alfred R.: *See*—
Landoll, Donald R.; Kongs, David J.; and Belknap, Alfred R., 4,492,507, Cl. 414-475.000.

Belko, Robert P.: *See*—
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Bellos, Thomas J., to Petrolite Corporation. Thioureylenes. 4,492,658, Cl. 260-455.00A.

Belykh, Sergei I.; Moschensky, Anatoly D.; Davydov, Anatoly B.; Pershin, Gely G.; Smirnov, Boris A.; and Gromov, Mikhail V., to Vsesojuzny Nauchno-Issledovatelsky I Ispytatelny Institut Meditsinskoi Tekhniki. Device for uniting bone fragments. 4,492,226, Cl. 128-92.0BC.

Bendix Corporation, The: *See*—
Walter, Chris J.; Wilson, Colleen R.; and Berkovich, Semyon, 4,493,074, Cl. 370-119.000.

Benson, John; Hanel, Harold L.; and Freeman, Douglas A., to International Telephone and Telegraph Corporation. Powder actuated tool. 4,492,329, Cl. 227-10.000.

Bentley, Arthur P. Pressure balanced liquid elevating mechanism. 4,492,528, Cl. 417-241.000.

Benz, Michael, deceased (by Benz, Violet E., Executrix), to Benz, Violet E.; Benz, Michael J.; and Benz, Randy, a part interest to each. Humane animal trap. 4,492,055, Cl. 43-88.000.

Benz, Michael J.: *See*—
Benz, Michael, deceased, 4,492,055, Cl. 43-88.000.

Benz, Randy: *See*—
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Bergmann, Ernest E., to AT&T Bell Laboratories. Polarization independent beam splitter. 4,492,436, Cl. 350-395.000.

Bergquist, Lyle E., to Martin Marietta Corporation. Ultra sensitive noble gas leak detector. 4,492,110, Cl. 73-40.700.

Bergstrom, Par-Halan: *See*—
Jelvestam, Roland E.; and Bergstrom, Par-Halan, 4,492,868, Cl. 250-345.000.

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Bertin, Patrice, to Valeo. Power-assisted steering device for motor vehicles. 4,492,283, Cl. 180-148.000.

Bertsch, Richard; Gunther, Dieter; and Steinbrenner, Ulrich, to Robert Bosch GmbH. Metering device for an internal combustion engine. 4,492,204, Cl. 123-489.000.

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Bettcher Industries, Inc.: *See*—
Bettcher, Louis A., 4,492,027, Cl. 30-276.000.

Bettcher, Louis A., to Bettcher Industries, Inc. Rotary hand knife. 4,492,027, Cl. 30-276.000.

Bicker, Uwe: *See*—
Bosies, Elmar; Gall, Rudi; Weimann, Gunter; Bicker, Uwe; and Pahlke, Wulf, 4,492,659, Cl. 260-925.000.

Bickl, Horst; Findeis, Gunter; and Treiber, Helmut, to Agfa-Gevaert AG. Method of and arrangement for copying a colored original. 4,492,458, Cl. 355-38.000.

Biegay, Jack M., to Allegheny Ludlum Steel Corporation. Method of welding steel strip. 4,492,849, Cl. 219-137.0WM.

Biemans, Arnoldus. Needle threading device. 4,492,325, Cl. 223-99.000.

Bieringer, Hermann: *See*—
Willms, Lothar; Huttelmaier, Thomas; Mildenberger, Hilmar; Bauer, Klaus; Burstell, Helmut; and Bieringer, Hermann, 4,492,598, Cl. 71-93.000.

Bieschke, Martin, to Textron Inc. Wire clamp assembly. 4,492,422, Cl. 339-95.00R.

Bilsing, Alfred. Conveyor robot. 4,492,511, Cl. 414-744.00A.

Bilyeu, Delford D., to Grumman Emergency Products, Inc. Pneumatic fire pump pressure controller. 4,492,525, Cl. 417-34.000.

BIP Chemicals Limited: *See*—
Williams, Richard S.; and Daniels, Terry, 4,492,782, Cl. 524-293.000.

Bischoff, Martin: *See*—
Rutzen, Horst; Nikolaus, Peter; Bischoff, Martin; and Lehmann, Rudolf, 4,492,802, Cl. 564-292.000.

Bixler, Kenneth D.; Reifers, Richard F.; and Lord, Henry A., to Packaging Corporation of America. Multi-row egg cartons. 4,492,331, Cl. 229-2.5EC.

Bizzell, Gary D.; and Ekern, William F., to Lockheed Missiles & Space Company, Inc. Manifolded evaporator for pump-assisted heat pipe. 4,492,266, Cl. 165-104.260.

Bjork, Anders K.; Abramo, Aina L.; and Christensson, Erik G. Diphenylbutyl-1-acylpiperazines. 4,492,698, Cl. 424-250.000.

Blackmore, Keith D.: *See*—
Rutherford, Dennis F.; and Blackmore, Keith D., 4,492,495, Cl. 405-294.000.

Blake, William W., to Caterpillar Tractor Co. Fluid control system for two independent actuators. 4,492,251, Cl. 137-596.160.

Blanchard, Gilbert; Brunelle, Jean-Pierre; and Prigent, Michel, to Pro-Catalyse. Pollution control catalyst for internal combustion engine exhaust system/catalytic converter and process for its preparation. 4,492,769, Cl. 502-262.000.

Blanchard, Gilbert; Brunelle, Jean-Pierre; and Prigent, Michel, to Procatalyse. Catalyst and use thereof in treating internal combustion engine exhaust gases. 4,492,770, Cl. 502-304.000.

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Tao, Luh C.; and Blease, James W., 4,492,637, Cl. 210-711.000.

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Blumenberg, Gunther: *See*—
Rohner, Peter; Schippl, Klausdieter; Blumenberg, Gunther; Meyer, Werner; and Obert, Wolfgang, 4,492,089, Cl. 62-55.000.

Blunt, Thomas O.: *See*—
DeLeeuw, Cornelius; and Blunt, Thomas O., 4,492,368, Cl. 269-32.000.

Bock, Hans-Christian: *See*—
Reinholdt, Bernd; and Bock, Hans-Christian, 4,492,134, Cl. 81-57.340.

Bock, Jan: *See*—
Valint, Paul L., Jr.; and Bock, Jan, 4,492,785, Cl. 524-529.000.

Boehm, Heinrich: *See*—
Rieber, Norbert; Boehm, Heinrich; and Adolphi, Heinrich, 4,492,689, Cl. 424-200.000.

Boehm, Peter: *See*—
Weiler, Rolf; Boehm, Peter; Haar, Lucas H.; and Timtner, Karlheinz, 4,492,081, Cl. 60-547.100.

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Bosies, Elmar; Gall, Rudi; Weimann, Gunter; Bicker, Uwe; and Pahlke, Wulf, 4,492,659, Cl. 260-925.000.
Trager, Ulrich; Sojka, Bernward; and Lange, Hans, 4,492,754, Cl. 435-28.000.

Boeing Company, The: *See*—
Erdmann, Joachim C.; and Gellert, Robert I., 4,492,465, Cl. 356-152.000.

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Boise Cascade Corporation: *See*—
Knutsen, Daniel P., 4,492,044, Cl. 34-114.000.

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Nilsson, Bruno Y., 4,492,924, Cl. 324-330.000.

Boling, Norman L.: *See*—
Mayer, Thomas; Temple, Michael D.; Boling, Norman L.; and Rancourt, James D., 4,492,718, Cl. 427-160.000.

Bollinger, Viktor. Air conditioning system for heated rooms. 4,492,086, Cl. 62-3.000.

Bomford & Evershed Limited: *See*—
Fox, John V., 4,492,273, Cl. 172-520.000.

Bonansea, Hubert: *See*—
Divoux, Michel; Bonansea, Hubert; and Constant, Bernard, 4,492,509, Cl. 414-387.000.

Boots Company PLC, The: *See*—
Emms, Norman R., 4,492,316, Cl. 221-202.000.

Bordato, James M.: *See*—
Van Allen, Kent; and Bordato, James M., 4,492,281, Cl. 177-213.000.
Bormann, Dieter: *See*—
Merkel, Wulf; Bormann, Dieter; and Muschaweck, Roman, 4,492,710, Cl. 424-274.000.
Borst, Gary M.: *See*—
Ware, Warren O.; Borst, Gary M.; and Abitz, Ronald E., 4,492,169, Cl. 108-6.000.
Boschi, Pier M.; Gozzo, Franco; and Longoni, Angelo, to Montedison S.p.A. Phosphoric and thiophosphoric esters of 5(3)-hydroxypyrazoles exerting an insecticidal action. 4,492,690, Cl. 424-200.000.
Boshagen, Horst: *See*—
Goldmann, Siegfried; Boshagen, Horst; Stoltefuss, Jurgen; Schramm, Matthias; Thomas, Gunter; and Kazda, Stanislav, 4,492,703, Cl. 424-266.000.
Boshra-Riad, Mokhtar; Fedeli, Jean-Marc; Jouve, Hubert; and Mauduit, Daniel, to Commissariat a l'Energie Atomique. Magnetic bubble store. 4,493,054, Cl. 365-36.000.
Bosies, Elmar; Gall, Rudi; Weimann, Gunter; Bicker, Uwe; and Pahlke, Wulf, to Boehringer Mannheim GmbH. Phospholipid compound. 4,492,659, Cl. 260-925.000.
Bosin, Sanford D.: *See*—
Hann, William; Bosin, Sanford D.; and White, Cecil, 4,492,578, Cl. 433-213.000.
Bottka, Nicholas; Lessoff, Howard; and Hills, Marian E., to United States of America, Navy. Multi-color tunable semiconductor device. 4,492,434, Cl. 350-356.000.
Boucraut, Frantz M. J., to Petit Bateau Valton S.A. Apparatus for drying and stabilizing pieces of woven or knitted fabric. 4,492,045, Cl. 34-122.000.
Boudreau, Daniel A.; and Salas, Edward R., to Honeywell Information Systems Inc. Priority resolver having dynamically adjustable priority levels. 4,493,036, Cl. 364-200.000.
Boultinghouse, Harold D., to Phillips Petroleum Company. Adhesive for butadiene styrene copolymer. 4,492,784, Cl. 524-473.000.
Bourdet, Gilbert L.; and Franco, Michel A., to Agence Nationale de Valorisation de la Recherche. Apparatus and method for distance measurement by laser interferometry. 4,492,464, Cl. 356-4.500.
Bourgein, John. Wall mounted knife holder. 4,492,028, Cl. 30-296.00A.
Bouteille, Daniel; Petrimaux, Eric; and Burban, Jean-Luc, to Legris. Pressure relay adapted to signal the position of the movable member of a jack. 4,492,149, Cl. 92-5.00R.
Boveri, Sergio: *See*—
Nisato, Dino; and Boveri, Sergio, 4,492,711, Cl. 424-285.000.
Bovio, Michele; and Gillone, Walter, to Ing. C. Olivetti & C., S.p.A. Data recording machine. 4,493,038, Cl. 364-405.000.
Boy, Jurgen: *See*—
Lange, Gerhard; and Boy, Jurgen, 4,493,004, Cl. 361-120.000.
Lange, Gerhard; Boy, Jurgen; Hoene, Ernst-Ludwig; and Sippekamp, Oskar, 4,493,006, Cl. 361-124.000.
Boyanton, Walter L., to Innovative Research and Development Co. Chain link fence system. 4,492,364, Cl. 256-47.000.
Boylan, John F. Filter cleaning device. 4,492,003, Cl. 15-406.000.
Bradfield, James E.: *See*—
Kahil, John E.; Jaynes, Mark S.; and Bradfield, James E., 4,492,115, Cl. 73-151.000.
Bradley, Harvey, to Bradley Lifting, Corp. Coil up-ending grab. 4,492,402, Cl. 294-103.0CG.
Bradley Lifting, Corp.: *See*—
Bradley, Harvey, 4,492,402, Cl. 294-103.0CG.
Brand, Bernhard: *See*—
Richter, Bruno; and Brand, Bernhard, 4,492,473, Cl. 356-386.000.
Brashears, David F.; and Mollick, Joseph T. Solid fuel burner. 4,492,171, Cl. 110-261.000.
Braswell, Richard R. Welders torch igniting device. 4,492,561, Cl. 431-128.000.
Bratt, Richard G.: *See*—
Gavrin, Edward S.; Bratt, Richard G.; Schleimer, Stephen I.; Pilat, John F.; Richmond, Michael S.; Wallach, Walter A., Jr.; Belgard, Richard A.; Farber, David A.; Ahlstrom, John K.; Wallach, Steven J.; Clancy, Gerald F.; Mundie, Craig J.; Jones, Thomas M.; Bachman, Brett L.; and Bernstein, David H., 4,493,023, Cl. 364-200.000.
Katz, Lawrence H.; Wells, Douglas M.; Richmond, Michael S.; Belgard, Richard A.; Wallach, Walter A., Jr.; Bernstein, David H.; Ahlstrom, John K.; Pilat, John F.; Farber, David A.; Bratt, Richard G.; and Bachman, Brett L., 4,493,027, Cl. 364-200.000.
Braun Aktiengesellschaft: *See*—
Radacanu, Dan-Corneliu, 4,492,910, Cl. 318-772.000.
Braus, Harry, to National Distillers and Chemical Corporation. Organopolysiloxanes useful as dielectric fluids and anti-treeing additives. 4,492,647, Cl. 252-573.000.
Brazeway, Inc.: *See*—
Carr, Charles R., 4,492,851, Cl. 219-201.000.
Brechlin, Alfred, to Hoechst Aktiengesellschaft. Flexible laminatable photosensitive layer. 4,492,747, Cl. 430-96.000.
Brede, Uwe; Horr, Alfred; and Penner, Horst, to Dynamit Nobel Aktiengesellschaft. Partially combustible propellant charge igniter. 4,492,167, Cl. 102-470.000.
Brett, Clive E.: *See*—
Pask, George; and Brett, Clive E., 4,492,521, Cl. 416-193.00A.
Breuers, Theo P. C.; Heijnen, Andreas T.; and Leppink, Arie, to Oce-Nederland B.V. Apparatus for delivering web material or the like from rolls. 4,492,138, Cl. 83-203.000.
Brewer, Robert A. Labeling keeper. 4,492,048, Cl. 40-2.00R.
Brezzo, Bernard; Calvignac, Jean; Dambricourt, Richard; Masclet, Andre; and Sanche, Jean-Pierre, to International Business Machines Corporation. Communication line scanning device for a communication controller. 4,493,051, Cl. 364-900.000.
Bright, Gene M., to Pfizer Inc. Antibacterial cyclic ethers of 9-deoxo-9a-aza-9a-homoerythromycin A and intermediates therefor. 4,492,688, Cl. 424-180.000.
Brinly-Hardy Co., Inc.: *See*—
Doering, Charles W., 4,492,271, Cl. 172-43.000.
Brister, Beryle D., to Brister, Incorporated. Apparatus and method for forming a temporary plug in a fluid conduit. 4,492,095, Cl. 62-293.000.
Brister, Incorporated: *See*—
Brister, Beryle D., 4,492,095, Cl. 62-293.000.
British Aerospace Public Limited Company: *See*—
Fieldus, Geoffrey H., 4,492,340, Cl. 239-265.250.
British Petroleum Company Limited, The: *See*—
Ball, William J.; Cotton, Leonard; and Stewart, David G., 4,492,772, Cl. 518-713.000.
Ball, William J.; Cotton, Leonard; and Stewart, David G., 4,492,773, Cl. 518-713.000.
British Petroleum Company p.l.c., The: *See*—
Barclay, John L.; Brooks, Alan G.; and Duebel, Clive P. J., 4,492,497, Cl. 406-153.000.
Broadhead, James H., to Syntex (U.S.A.) Inc. Patient support and transverse motion linkage therefor. 4,492,407, Cl. 297-78.000.
Brodt, Peter: *See*—
Frankenfeld, Klaus; Ruschke, Peter; Brodt, Peter; and Eich, Gerhard, 4,492,680, Cl. 423-321.00S.
Broer, Dirk J.; and De Poorter, Adriaan W., to U.S. Philips Corporation. Optical recording disc. 4,492,967, Cl. 346-135.100.
Brogardh, Torgny; Linge, Anders; and Sander, Lars, to Asea Aktiebolag. Optical measuring device with means for suppressing reflections. 4,492,860, Cl. 250-227.000.
Brooks, Alan G.: *See*—
Barclay, John L.; Brooks, Alan G.; and Duebel, Clive P. J., 4,492,497, Cl. 406-153.000.
Brooks, Robert L.: *See*—
Young, Raymond H.; Morris, Horton H.; and Brooks, Robert L., 4,492,628, Cl. 209-5.000.
Brown, Boveri & Cie AG: *See*—
Haberfellner, Fritz; Mennicke, Stefan; and Prappacher, Gerd, 4,492,742, Cl. 429-104.000.
Brown, David J.; Markin, Trevor L.; and Dell, Ronald M., to Lucas Industries Limited. Secondary zinc electrode for a secondary electrochemical cell. 4,492,744, Cl. 429-217.000.
Brown, David L.: *See*—
Garcia, Frank, Jr.; and Brown, David L., 4,492,362, Cl. 251-363.000.
Brown & Sharp Manufacturing Company: *See*—
Beckwith, Walter L., Jr., 4,492,036, Cl. 33-180.00R.
Bruene, Warren B., to Rockwell International Corporation. Antenna tuner discriminator. 4,493,112, Cl. 455-123.000.
Bruker-Analytische Messtechnik GmbH: *See*—
Koch, Dieter; and Gianotti, Tonio, 4,492,524, Cl. 417-18.000.
Brunelle, Jean-Pierre: *See*—
Blanchard, Gilbert; Brunelle, Jean-Pierre; and Prigent, Michel, 4,494,769, Cl. 502-262.000.
Blanchard, Gilbert; Brunelle, Jean-Pierre; and Prigent, Michel, 4,492,770, Cl. 502-304.000.
Brunn, Horst; Hund, Franz; Rambold, Wolfgang; Kresse, Peter; and von Szadkowski, Gerd, to Bayer Aktiengesellschaft. Corrosion-inhibiting paints and lacquers. 4,492,600, Cl. 106-14.340.
Bruno, Melle . Process for the continuous foaming of plastics. 4,492,664, Cl. 264-46.200.
Bruno Richter GmbH: *See*—
Richter, Bruno; and Brand, Bernhard, 4,492,473, Cl. 356-386.000.
Brunswick Corporation: *See*—
Moss, Elvis W., 4,492,347, Cl. 242-84.20R.
Staerzl, Richard E., 4,492,877, Cl. 307-95.000.
Brzezinski, Alex M.; Hershey, Harold J.; and Whitesell, Stephen R., to AT&T Bell Laboratories. Electroacoustic transducer. 4,492,825, Cl. 179-111.00R.
BS&B Safety System, Inc.: *See*—
Naumann, Leo J., 4,492,103, Cl. 72-55.000.
bso Steuerungstechnik GmbH: *See*—
Heidelberger, Walter; and Morsch, Joachim, 4,492,128, Cl. 74-471.0XY.
Buchwald, Hans; and Raschkowski, Bolesiaus, to Kali-Chemie AG. Process for the chip forming, cutting or abrasive working of metals. 4,492,641, Cl. 252-48.400.
Buffalo Color Corporation: *See*—
Nagpal, Krishen L., 4,492,683, Cl. 424-309.000.
Builders Equipment Company: *See*—
Thomas, Paul M.; and Abrahamson, Daniel P., 4,492,503, Cl. 414-152.000.
Buljan, Sergej-Tomislav, to GTE Products Corporation. Si_3N_4 ceramic articles having lower density outer layer, and method. 4,492,765, Cl. 501-97.000.
Buller, Paul L.: *See*—
Fair, Delbert W.; and Buller, Paul L., 4,492,285, Cl. 181-114.000.
Burban, Jean-Luc: *See*—
Bouteille, Daniel; Petrimaux, Eric; and Burban, Jean-Luc, 4,492,149, Cl. 92-5.00R.
Burgdorf, Jochen: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; and Weise, Lutz, 4,492,413, Cl. 303-92.000.

Burgkhart, Bertram; Hassib, Gabor; and Piesch, Ernst, to Kernforschungszentrum Karlsruhe GmbH. Albedo dosimeter encapsulation. 4,492,872, Cl. 250-484.100.

Burke, James E., to Hosid, Jack B. Fluid dispensing massage device. 4,492,223, Cl. 128-57.000.

Burke, John M., to Eaton Corporation. Process for cleaning metal working fluids for re-use. 4,492,636, Cl. 210-706.000.

Burkhardt, James L.; and McCann, John J., to Polaroid Corporation. Processor for enhancing video signals for photographic reproduction. 4,492,987, Cl. 358-332.000.

Burnam, Michael H.: *See*—
Shell, William E.; Burnam, Michael H.; and Tokes, Zoltan A., 4,492,753, Cl. 435-17.000.

Burns, John W., to Marconi Company Limited, The. Planar, quadrature microwave coupler. 4,492,939, Cl. 333-116.000.

Burroughs Corporation: *See*—
Kim, Dongsung R.; and McClintock, John H., Jr., 4,493,019, Cl. 364-200.000.
Kim, Dongsung R.; and McClintock, John H., Jr., 4,493,020, Cl. 364-200.000.
Mayer, Thomas; Temple, Michael D.; Boling, Norman L.; and Rancourt, James D., 4,492,718, Cl. 427-160.000.
Osman, Ismet M. F. M., 4,493,055, Cl. 365-78.000.

Burstell, Helmut: *See*—
Willms, Lothar; Huttelmaier, Thomas; Mildenberger, Hilmar; Bauer, Klaus; Burstell, Helmut; and Bieringer, Hermann, 4,492,598, Cl. 71-93.000.

Burton, Clement; Kremer, Andre; Stomp, Hubert; and Solvi, Marc. Centrifugal drum for metallurgical slag. 4,492,342, Cl. 241-67.000.

Busch, Dieter: *See*—
Raasch, Hans; and Busch, Dieter, 4,492,077, Cl. 57-414.000.

Bush, Alvin A.: *See*—
Anderson, Thomas E.; Bush, Alvin A.; and Giorgis, John, 4,492,881, Cl. 307-270.000.

Bush, Harry: *See*—
Woods, Arthur F.; Bush, Harry; and Kana, Eugene J., 4,492,392, Cl. 285-119.000.

Bylin Heating Systems, Inc.: *See*—
Bylin, Robert O., 4,492,355, Cl. 248-206.500.

Bylin, Robert O., to Bylin Heating Systems, Inc. Magnetic mount for heating module. 4,492,355, Cl. 248-206.500.

Bynoe, Robert J., to B. F. Goodrich Company, The. Insulated roof construction. 4,492,064, Cl. 52-309.800.

Byram, George W., to United States of America, Navy. Apparatus for measuring the spatial scalar variation of a magnetic field with three mutually orthogonal gradiometers on a moderately stable moving platform. 4,492,923, Cl. 324-207.000.

Byrd, James D.: *See*—
Junior, Kenneth E.; and Byrd, James D., 4,492,779, Cl. 523-138.000.

C. A. Weidmuller GmbH & Co.: *See*—
Wiener, Hans; and Undin, Hans, 4,492,026, Cl. 30-90.900.

C-I-L Inc.: *See*—
Marz, Horst F., 4,492,165, Cl. 102-313.000.

Cabrillat, Marie-Therese; and Lions, Noel, to Commissariat a l'Energie Atomique. Fast neutron nuclear reactor. 4,492,667, Cl. 376-405.000.

Cadars, Patrick, to Valeo. Water box and expansion chamber device for a heat exchanger. 4,492,267, Cl. 165-104.320.

Cadillac Gage Company: *See*—
Appelblatt, Irving; and Krawiecki, Peter, 4,492,282, Cl. 180-68.100.

Cahuzac, Georges J. J., to Societe Nationale Industrielle Aerospatiale. Hollow reinforcements of revolution made by three-dimensional weaving method and machine for fabricating such reinforcements. 4,492,096, Cl. 66-11.000.

California Institute of Technology: *See*—
Kralik, James G.; and Corcoran, William H., 4,492,588, Cl. 44-1.00R.

Calma Company: *See*—
Collmeyer, Arthur J.; Hoel, Jeffrey H.; King, Paul F.; Stanley, Donald O.; and Sturgeon, Roger, 4,492,956, Cl. 340-723.000.

Calvignac, Jean: *See*—
Brezzo, Bernard; Calvignac, Jean; Dambricourt, Richard; Masclet, Andre; and Sanche, Jean-Pierre, 4,493,051, Cl. 364-900.000.

Campbell, Frank L.; Barnum, Dean C.; and Corea, William C., to Chevron Research Company. Means and method for facilitating measurements while coring. 4,492,275, Cl. 175-46.000.

Campbell, Russell J., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Error correcting code decoder. 4,493,080, Cl. 371-37.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Campbell, Russell J., 4,493,080, Cl. 371-37.000.

Canon Kabushiki Kaisha: *See*—
Hiramatsu, Akira, 4,492,453, Cl. 354-479.000.
Kan, Yasuhito; and Miyamoto, Koichi, 4,492,371, Cl. 271-21.000.
Mitsuaki, Seki; Tazaki, Shigemitsu; and Shirato, Yoshiaki, 4,492,966, Cl. 346-33.00A.
Omata, Takashi, 4,492,459, Cl. 355-43.000.
Takimoto, Hiroyuki; Kuniyoshi, Takashi; and Ushiro, Tatsuzo, 4,492,982, Cl. 358-228.000.
Terasawa, Koji, 4,492,969, Cl. 346-140.00R.

Cantell, Anthony S.: *See*—
Hayes, Ernest B.; and Cantell, Anthony S., 4,492,240, Cl. 131-336.000.

Canyon Corporation: *See*—
Tada, Tetsuya, 4,492,320, Cl. 222-398.000.

Carnegie-Mellon University: *See*—
Kung, Hsiang-Tsung; and Leiserson, Charles E., 4,493,048, Cl. 364-754.000.

Carr, Charles R., to Brazeway, Inc. Swap action arrangement mounting an electric defroster heater to a finned refrigeration unit. 4,492,851, Cl. 219-201.000.

Carrico, Robert J.: *See*—
Boguslaski, Robert C.; Carrico, Robert J.; and Christner, James E., 4,492,751, Cl. 435-7.000.

Carrier Corporation: *See*—
Jennings, William B.; Kozlowski, Robert M.; and Hayes, Richmond S., Jr., 4,492,269, Cl. 165-172.000.
Kuhn, Gerhard; and Jacobs, John J., 4,492,127, Cl. 74-50.000.
Martin, Gregory W., 4,492,327, Cl. 226-177.000.
Smorol, Michael E.; Wituszynski, Michael C.; and Woollis, Theodore L., 4,492,092, Cl. 62-181.000.
Whitwell, Robert J.; and Schafer, James P., 4,492,091, Cl. 62-180.000.

Carter, Michael R.: *See*—
Cumberton, John; Foster, Alun E.; Rae, Alexander S.; Fernandes, Vernon J.; and Carter, Michael R., 4,493,082, Cl. 371-43.000.

Carter, Russell W., to Corn States Metal Fabricators, Inc. Valve unit for a mold vent. 4,492,554, Cl. 425-383.000.

Casella, Linda J., to Corning Glass Works. Use of hydrolyzed whey products in fermented sausages. 4,492,712, Cl. 426-59.000.

Casella, Linda J., to Corning Glass Works. Use of hydrolyzed whey products in comminuted meat products. 4,492,715, Cl. 426-646.000.

Caspers, Friedhelm, to Elektro-Physik & Erich Steingroever. Method and apparatus for the electronic measurement of the thickness of very thin electrically conductive films on a nonconductive substrate. 4,492,915, Cl. 324-58.50R.

Cassanas, Claude; Couot, Jean-Pierre; and Royer, Jacques, to U.S. Philips Corporation. Printer with inker on the platen roller. 4,492,164, Cl. 101-216.000.

Caterpillar Tractor Co.: *See*—
Blake, William W., 4,492,251, Cl. 137-596.160.

Cavitron, Inc.: *See*—
Warrin, George E.; and Perdreaux, Rene J., 4,492,574, Cl. 433-81.000.

Cellai, Stelvio S. Automatic self-propelled devices for travelling on a track cable. 4,492,168, Cl. 105-30.000.

CEM Cie Electro-Mecanique: *See*—
Leser, Jacques F., 4,492,477, Cl. 356-430.000.

Ceskoslovenska akademie ved: *See*—
Zverina, Karel; and Kroupa, Petr, 4,492,766, Cl. 501-104.000.

Chadwick, Lee S., II. Curvilinear polyhedral construction kit. 4,492,723, Cl. 428-7.000.

Chakrabarti, Jiban K.; Hotten, Terrence M.; and Steggles, David J., to Lilly Industries Limited. Triazolobenzodiazepine derivatives. 4,492,699, Cl. 424-250.000.

Cham, Edward J.; and Specht, Theodore R., to Westinghouse Electric Corp. Rectifier transformer. 4,493,016, Cl. 363-126.000.

Champion International Corporation: *See*—
Meeker, David M.; and Lillibridge, Harold R., 4,492,308, Cl. 206-610.000.
Roberts, Harry H., 4,492,333, Cl. 229-22.000.

Chang, Richard S.; Ling, John Y.; and Shoff, Daniel J., to Mattel, Inc. Teaching and entertainment device. 4,492,582, Cl. 434-169.000.

Chao, Allen C.; Huang, Barney K.; and Wang, James S. J. Method and apparatus for drying and handling sludge. 4,492,039, Cl. 34-4.000.

Chapelain, Jean-Pierre: *See*—
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Charlat, Patrice: *See*—
Mallen-Herrero, Jose; Leroy, Daniel; Zimmermann, Urs; and Charlat, Patrice, 4,492,541, Cl. 418-23.000.

Charles Stark Draper Laboratory, Inc., The: *See*—
Pruzenski, Anthony S., Jr., 4,492,859, Cl. 250-216.000.

Chauvin, John A. Method of automatic roux making. 4,492,713, Cl. 426-231.000.

Cheh, Christopher H.; and Glass, Roger W. Carbon dioxide removal method employing packed solid calcium hydroxide. 4,492,649, Cl. 252-630.000.

Chembakaffery, George M.: *See*—
Zapletal, Henry; Wentzek, Horst F.; and Chembakaffery, George M., 4,492,298, Cl. 198-409.000.

Chemische Fabrik Budenheim: *See*—
Frankenfeld, Klaus; Ruschke, Peter; Brodt, Peter; and Eich, Gerhard, 4,492,680, Cl. 423-321.00S.

Chen, C. N.: *See*—
Jou, W. F.; and Chen, C. N., 4,492,945, Cl. 337-229.000.

Cherbuy, Bernard: *See*—
Voirin, Jean-Philippe; and Cherbuy, Bernard, 4,492,178, Cl. 118-653.000.

Chevron Research Company: *See*—
Campbell, Frank L.; Barnum, Dean C.; and Corea, William C., 4,492,275, Cl. 175-46.000.

Chikaraishi, Takayo; Tuchiya, Yosimasa; and Kawamo, Kazunori, to Nissan Motor Company, Limited; and Nissan Shatai Company, Limited. Sealing structure for automotive vehicle side doors. 4,492,405, Cl. 296-146.000.

Chinn, Bryan P.; Armour, John S.; Watson, Peter M. F.; and Donne, Graham L., to Secretary of State for Her Majesty's Government of the United Kingdom and Britain. Non-spill liquid fuel tanks. 4,492,244, Cl. 137-38.000.

Chiotasso, Pierre; and Dostes, Jacques, to Societe Spart. Automatic distributor-feeder with plural compartments for granular food for domestic animals. 4,492,183, Cl. 119-51.130.
Chiu, Kin-Chung R.: *See*—
Bean, John C.; Chiu, Kin-Chung R.; and Poate, John M., 4,492,971, Cl. 357-15.000.
Chiu, Robert C., to R&C Chiu International, Inc. Loudspeaker. 4,492,826, Cl. 179-115.5PS.
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Wright, Michael L.; and Tilley, Alec R., 4,492,021, Cl. 29-623.100.
Chmela, Franz; Herzog, Walter; and Meier, Richard, to M.A.N. Maschinenfabrik. Spark-ignition air-compressing internal combustion engine. 4,492,194, Cl. 123-276.000.
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Chometon, Pierre; and Dollfus, Jacques, to Commissariat a l'Energie Atomique. Device for damping shocks caused by moving heavy objects. 4,492,291, Cl. 188-377.000.
Chong, Ian, to General Drapery Services, Inc. Shading system. 4,492,261, Cl. 160-319.000.
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Bjork, Anders K.; Abramo, Aina L.; and Christensson, Erik G., 4,492,698, Cl. 424-250.000.
Christine, David R.; and Terry, John F., Jr. Road repair spreader. 4,492,490, Cl. 404-108.000.
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Christner, James E.: *See*—
Bogusiaski, Robert C.; Carrico, Robert J.; and Christner, James E., 4,492,751, Cl. 435-7.000.
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Drabek, Jozef, 4,492,705, Cl. 424-270.000.
Ghisalba, Oreste; Heinzer, Franz; and Kuenzi, Martin, 4,492,756, Cl. 435-253.000.
Maul, Rudolf; Otto, Eberhard; and Zinke, Horst, 4,492,661, Cl. 260-976.000.
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CIC Int'l. Corp.: *See*—
Levine, Morris M., 4,492,550, Cl. 425-142.000.
Cii Honeywell Bull (Societe Anonyme): *See*—
Voirin, Jean-Philippe; and Cherbuy, Bernard, 4,492,178, Cl. 118-653.000.
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Clark, John I., to Pitney Bowes Inc. Postage printing apparatus having a movable print head and a hollow non-rotating support shaft. 4,492,158, Cl. 101-71.000.
Clark, John I., to Pitney Bowes Inc. Postage printing apparatus having a print head with a replaceable ribbon cartridge. 4,492,159, Cl. 101-71.000.
Clark, John I.; and Eckert, Alton B., to Pitney Bowes Inc. Postage printing apparatus having a movable print head and a variable speed drum rotation. 4,492,160, Cl. 101-71.000.
Clark, Kenneth M., to Hughes Aircraft Company. Method for optically finishing connector-mounted optical fibers. 4,492,060, Cl. 51-283.00R.
Clark, Robert F.: *See*—
Evans, Edwin R.; and Clark, Robert F., 4,492,786, Cl. 524-865.000.
Clarke, Herbert H., Jr.; and Reefman, William E. Self-arcing tank segments. 4,492,065, Cl. 52-595.000.
Claussen, Uwe, to Bayer Aktiengelselellschaft. Light-collecting systems using halogenated perylene derivatives as light converters. 4,492,648, Cl. 252-582.000.
Claussen, Uwe; Merten, Josef; Rohr, Harry; and Melchior, Bernd, to Bayer Aktiengesellschaft. Method for making fluorescent light-collectors. 4,492,778, Cl. 523-137.000.
Clayton, Robert H., to Perkin-Elmer Corporation, The. Electron gun assembly. 4,493,097, Cl. 378-137.000.
Clayton, Wilson A.; and Galperin, Alexander, to Leeds & Northrup Company. Fast response surface contact temperature sensor. 4,492,948, Cl. 338-25.000.
Clegg, John E. Solar collector. 4,492,424, Cl. 350-96.100.
Clegg, John E. Conical wide-field microscopic lens. 4,492,438, Cl. 350-432.000.
Clegg, John E. Monochromatic beam concentrator. 4,492,439, Cl. 350-432.000.
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Park, Joon B., 4,491,987, Cl. 3-1.910.
Cline, Harvey E., to General Electric Company. Diffraction grating wire arrays in series. 4,492,738, Cl. 428-611.000.
Cline, Harvey E., to General Electric Company. Eutectic fine wire arrays. 4,492,739, Cl. 428-611.000.
Cobb, Jack M., to Hughes Aircraft Company. Method for fabricating corrugated microwave components. 4,492,020, Cl. 29-600.000.
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Colbert, Raymond O.; and Hellman, Bengt H., to AT&T Bell Laboratories. Power supply switching arrangement. 4,492,876, Cl. 307-66.000.
Collins, Thomas D., to Sonoco Products Company. Carton divider. 4,492,332, Cl. 229-15.000.
Collmeyer, Arthur J.; Hoel, Jeffrey H.; King, Paul F.; Stanley, Donald O.; and Sturgeon, Roger, to Calma Company. Graphics display system and method including preclipping circuit. 4,492,956, Cl. 340-723.000.
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Mallen-Herrero, Jose; Leroy, Daniel; Zimmermann, Urs; and Charlat, Patrice, 4,492,541, Cl. 418-23.000.
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Khimeche, Abdel-Cader; and Kemler, Marc, 4,493,076, Cl. 371-11.000.
Completion Tool Company: *See*—
Wood, Edward T., 4,492,383, Cl. 277-34.000.
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Schmidt, Frederick W., 4,493,081, Cl. 371-38.000.
Connaught Laboratories Limited: *See*—
Goosen, Mattheus F. A.; and Sun, Anthony M. F., 4,492,684, Cl. 424-19.000.
Connelly, Richard E., to Contractor Equipment Manufacturers, Inc. Resilient type exercising device with removable weights. 4,492,375, Cl. 272-134.000.
Conoco Inc.: *See*—
Fair, Delbert W.; and Buller, Paul L., 4,492,285, Cl. 181-114.000.
Thomas, Bobby J.; and Heath, Billy J., 4,493,067, Cl. 367-189.000.
Conolly, Ralph I., to Rolls-Royce Limited. Composite metallic and non-metallic articles. 4,492,737, Cl. 428-552.000.
Considine, William H. Method of making representations of, and method of and means for making, printed circuit boards. 4,492,460, Cl. 355-133.000.
Constant, Bernard: *See*—
Divoux, Michel; Bonansea, Hubert; and Constant, Bernard, 4,492,509, Cl. 414-387.000.
Contractor Equipment Manufacturers, Inc.: *See*—
Connelly, Richard E., 4,492,375, Cl. 272-134.000.
Cooke, Robert S., to Allied Corporation. Partially deacylated ultra-high molecular weight poly(N-propionylethylenimines). 4,492,788, Cl. 525-410.000.
Coope, Daniel F.: *See*—
Murphy, Richard D.; and Coope, Daniel F., 4,492,865, Cl. 250-265.000.
Cooper, Clinton T. Method and apparatus for enhancing the fire combatant properties of safety cans. 4,492,319, Cl. 222-108.000.
Cooper, Gordon C.; and Dawson, Douglas, to Rolls-Royce Limited. Sealing plug. 4,492,381, Cl. 277-2.000.
Cooper Industries, Inc.: *See*—
Maros, Ronald R., 4,492,815, Cl. 174-78.000.
Workman, William, Jr., 4,492,146, Cl. 91-29.000.
Cooper, Penny S.; and Miller, Richard L., to Cooper, Penny S. Magazine page dehydrated foods in plastic bags. 4,492,306, Cl. 206-216.000.
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CooperVision, Inc.: *See*—
Atkinson, Ivor B.; and Holdstock, Barry C., 4,492,776, Cl. 523-108.000.
Copal Company Limited: *See*—
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Corcoran, William H.: *See*—
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Corea, William C.: *See*—
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Corn States Metal Fabricators, Inc.: *See*—
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Corneil, Dennis J.: *See*—
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Cornelio, Francesco. Smoking blend effective to discourage the bad habit of smoking and cigarettes or the like obtained thereby. 4,492,239, Cl. 131-270.000.
Corning Glass Works: *See*—
Casella, Linda J., 4,492,712, Cl. 426-59.000.
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Cosden Technology, Inc.: *See*—
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Picolet, Jean-Pierre; Rudloff, Jean-Loup; and Courtet, Francois, 4,492,225, Cl. 128-87.00R.
Cox, Larry. Magnetic holding apparatus. 4,492,367, Cl. 269-8.000.
Cozzi, Paolo; Pillan, Antonio; and Lovisolo, Pier P., to Farmitalia Carlo Erba S.p.A. N-Imidazolyl derivatives of 1,2,3,4-tetrahydro-naphthalene and indan. 4,492,707, Cl. 424-273.00R.
Crandell, Walter R., to Fast Heat Element Mfg. Co., Inc. Unitary heated nozzle assembly. 4,492,556, Cl. 425-549.000.
Crea, David A., to FMC Corporation. Recovery of phosphorus from waste ponds. 4,492,627, Cl. 209-3.000.
Creighton, Kenneth R. Hydraulic energy drill bit. 4,492,277, Cl. 175-329.000.
Croce, Carmen L.: *See*—
Apothaker, Richard L.; Reed, James; Croce, Carmen L.; and Wagner, Frederick B., III, 4,492,951, Cl. 338-316.000.
Crouch, Donald W.; and Sofianek, Joseph C., to General Electric Company. Guide means for the movable contact rod of a vacuum interrupter. 4,492,837, Cl. 200-144.00B.
Csanda, Ferenc: *See*—
Szekely, Tamas; Csanda, Ferenc; Nagy, Gabor; and Czerny, Gyozo, 4,492,494, Cl. 405-264.000.
Csemniczky, Janos; and Jozsa, Istvan, to Ganz-Mavag Mozdony-Vagon-es Gepgyar. Shaft pipe construction for regulating liquid delivery of submersible pumps. 4,492,532, Cl. 417-360.000.
Cullinan, George J.: *See*—
Fleisch, Jerome H.; Marshall, Winston S.; and Cullinan, George J., 4,492,704, Cl. 424-269.000.
Culp, Dennis S.: *See*—
Allbright, Charles T.; and Culp, Dennis S., 4,492,724, Cl. 428-40.000.
Cumbertoo, John; Foster, Alun E.; Rae, Alexander S.; Fernandes, Vernon J.; and Carter, Michael R., to Plessey Overseas Limited. Soft decision convolutional code transmission systems. 4,493,082, Cl. 371-43.000.
Curley, John E., to PPG Industries, Inc. Method and apparatus for liquefying material with retainer means. 4,492,594, Cl. 65-134.000.
Curt G. Joa, Inc.: *See*—
Hirsch, John L.; and Freitag, Ludwig W., 4,492,608, Cl. 156-467.000.
Curtis, George F., to Maremont Corporation. Feeding mechanism for a gas operated machine gun. 4,492,145, Cl. 89-33.200.
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Kaufmann, Erich, 4,492,416, Cl. 384-474.000.
Dahlberg, Reinhard. Thermoelectrical arrangement. 4,492,809, Cl. 136-212.000.
Daiichi Engineering Co., Ltd.: *See*—
Iwata, Noboru, 4,492,538, Cl. 417-477.000.
Daiichi Seito Kabushiki Kaisha: *See*—
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Dainippon Screen Manufacturing Co., Ltd.: *See*—
Tsuda, Masaya; Yonemaru, Ken-Ichi; and Masuda, Yoshikazu, 4,492,977, Cl. 358-75.000.
Dalton, Betty J. Head covering for women with hair loss. 4,491,985, Cl. 2-171.000.
Dalton, Betty J. Head scarf for women with hair loss. 4,492,242, Cl. 132-53.000.
Dambricourt, Richard: *See*—
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Daniels, Stuart F., to Siemens Corporation. Method and apparatus for testing a digital computer. 4,493,078, Cl. 371-25.000.
Daniels, Terry: *See*—
Williams, Richard S.; and Daniels, Terry, 4,492,782, Cl. 524-293.000.
Daskalakis, Costas N.: *See*—
Farhangi, Hassan; Miles, Peter R.; and Daskalakis, Costas N., 4,493,106, Cl. 382-41.000.
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Bachman, Brett L.; Nealon, James T.; and Young, Charles J., 4,493,025, Cl. 364-200.000.
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Gavrin, Edward S.; Bratt, Richard G.; Schleimer, Stephen I.; Pilat, John F.; Richmond, Michael S.; Wallach, Walter A., Jr.; Belgard, Richard A.; Farber, David A.; Ahlstrom, John K.; Wallach, Steven J.; Clancy, Gerald F.; Mundie, Craig J.; Jones, Thomas M.; Bachman, Brett L.; and Bernstein, David H., 4,493,023, Cl. 364-200.000.
Katz, Lawrence H.; Wells, Douglas M.; Richmond, Michael S.; Belgard, Richard A.; Wallach, Walter A., Jr.; Bernstein, David H.; Ahlstrom, John K.; Pilat, John F.; Farber, David A.; Bratt, Richard G.; and Bachman, Brett L., 4,493,027, Cl. 364-200.000.
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Davies, Gwilym R., to Imperial Chemical Industries PLC. Method of preparing tetrahalobenzene compounds. 4,492,617, Cl. 204-73.00R.
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Renfroe, Charles J.; and Davies, William, 4,492,401, Cl. 294-101.000.
Davis, Bennie I. Folding fishing net. 4,492,052, Cl. 43-12.000.
Davis, Bobby V. Mailbox signaling device. 4,492,335, Cl. 232-35.000.
Davis, C. Arthur. Variable leverage oil field pump jack. 4,492,126, Cl. 74-41.000.
Davydov, Anatoly B.: *See*—
Belykh, Sergei I.; Moschensky, Anatoly D.; Davydov, Anatoly B.; Pershin, Gely G.; Smirnov, Boris A.; and Gromov, Mikhail V., 4,492,226, Cl. 128-92.0BC.
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Cooper, Gordon C.; and Dawson, Douglas, 4,492,381, Cl. 277-2.000.
Dearman, Timothy C. Apparatus for use in welding. 4,492,015, Cl. 29-281.500.
Deaver, Dick: *See*—
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de Chambost, Emmanuel; and Trotel, Jacques, to Thomson-CSF. Angular limitation device in a charged particle beam system. 4,492,870, Cl. 250-398.000.
Declerck, Gabriel D.: *See*—
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DeFreitas, Elaine C., to Wistar Institute of Anatomy and Biology, The. HLA D Typing assay. 4,492,760, Cl. 436-503.000.
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Klenk, Herbert, 4,492,793, Cl. 548-141.000.
Muller, Johannes; Kunst, Helmut; and Scondo, Christian, 4,492,604, Cl. 148-15.500.
Rutzen, Horst; Nikolaus, Peter; Bischoff, Martin; and Lehmann, Rudolf, 4,492,802, Cl. 564-292.000.
Werle, Peter; Focke, Holger; Popp, Klaus; and Merk, Wolfgang, 4,492,643, Cl. 252-311.000.
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Maassen, Egbertus J. P.; and de Jong, Frederik J., 4,492,451, Cl. 354-416.000.
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Mickelson, Nils P.; and De LaChapelle, Richard P., 4,493,003, Cl. 361-119.000.
Delano, Charles G. Technique for picking up and laying down pipe. 4,492,502, Cl. 414-22.000.
DeLeeuw, Cornelius; and Blunt, Thomas O., to General Electric Company. Force applying apparatus. 4,492,368, Cl. 269-32.000.
Delius, Henry B., to Arcair Company. Constant potential/constant current automatic control system for air-carbon arc metal removal. 4,492,841, Cl. 219-69.00R.
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Brown, David J.; Markin, Trevor L.; and Dell, Ronald M., 4,492,744, Cl. 429-217.000.
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Denckert, Lennart H. Electric distribution center. 4,492,419, Cl. 339-18.00C.
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Kato, Masaaki; Miyoshi, Teruzo; Kibayashi, Iwao; Ikemi, Masahisa; Gomi, Haruo; Ishimatsu, Yoshiaki; Koizumi, Noriaki; and Yamada, Hideaki, 4,492,757, Cl. 435-280.000.
Denton, Robert K., Jr.; and Kumar, Narayan G., to Johnson & Johnson Dental Products Co. Heat treated barium or strontium glass. 4,492,777, Cl. 523-115.000.
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Broer, Dirk J.; and De Poorter, Adriaan W., 4,492,967, Cl. 346-135.100.

Desaar, Rene . Porous nozzle for blowing gas through steel. 4,492,365, Cl. 266-220.000.
DeSantis, Michelangelo. Rotatable cooking device. 4,492,152, Cl. 99-397.000.
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Pardini, Franco P.; and De Vizzi, Francesco, 4,492,836, Cl. 200-144.00R.
Deweck, Lionel, to Motorola, Inc. Infra-red receiver front end. 4,492,931, Cl. 330-294.000.
de Wit, Hendrik: *See*—
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de Wit, Hendrik C. Collapsible shopping cart. 4,492,388, Cl. 280-651.000.
DeWoolfson, Bruce H., to Environmental Products Corporation. Automated redemption center for metal containers. 4,492,295, Cl. 194-4.00C.
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Diamond Shamrock Chemicals Company: *See*—
Schick, Martin J.; and Kelley, Edwin L., 4,492,589, Cl. 44-51.000.
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Diaz, Zaida, to Shell Oil Company. Sequential liquid solid desiccation of supercritical and nearcritical CO2. 4,492,593, Cl. 62-18.000.
Dicker, David, to Transkrit Corporation. Tentless continuous mailer assembly. 4,492,334, Cl. 229-69.000.
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Palz, Helmut, 4,492,568, Cl. 432-30.000.
Diesel Kiki Co., Ltd.: *See*—
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Oshizawa, Hidekazu, 4,492,196, Cl. 123-357.000.
Yamamoto, Katsuichi, 4,492,540, Cl. 418-23.000.
Diesel Kiki Co., Ltd. (Japanese Corp.): *See*—
Swain, James C.; and Thomas, David L., 4,492,527, Cl. 417-222.000.
DiGianvittorio, Fiorindo. Outdoor portable charcoal gas grill. 4,492,215, Cl. 126-9.00R.
Dignan, Donald J., to Eastern Company, The. Adjustable-grip latch. 4,492,394, Cl. 292-64.000.
Dimeff, John, to Mark Telephone Products, Inc. Circuit for linearization of transducer. 4,492,122, Cl. 73-708.000.
Dinse, Wolfgang; Balzeit, Ralf; and Gesell, Reinhard, to Dr.-Ing. Rudolf Hell GmbH. Drum scanners. 4,492,984, Cl. 358-289.000.
Dischert, William A., to RCA Corporation. Video disc player having carriage drive mechanism. 4,493,070, Cl. 369-77.200.
Diversified Medical Systems, Inc.: *See*—
Hajianpour, Mohamad-Ali, 4,492,222, Cl. 128-25.00R.
Divoux, Michel; Bonansea, Hubert; and Constant, Bernard, to Hotchkiss-Brandt Sogeme H.B.S. Object-conveying box, and object-sorting machine equipped with such boxes. 4,492,509, Cl. 414-387.000.
Dix, Joseph, to General Electric Company. Transport mechanism for ammunition. 4,492,144, Cl. 89-33.170.
DMB Enterprises, Inc.: *See*—
Hoagland, Merle R.; Hoagland, Robert M.; and Hoagland, Dean W., 4,492,506, Cl. 414-463.000.
Dmitriev, Stanislav P.; Ivanov, Andrei S.; Sviniin, Mikhail P.; and Fedotov, Mikhail T. Apparatus for electron beam irradiation of objects. 4,492,873, Cl. 250-492.300.
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Peter, Dietmar, 4,492,398, Cl. 293-120.000.
Dr.-Ing. Rudolf Hell GmbH: *See*—
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Dr. Johannes Heidenhain GmbH: *See*—
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Doggett, William N.: *See*—
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beam furnaces and walking beam furnace for performing the said method. 4,492,565, Cl. 432-11.000.
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Kasuya, Katsuhiko; Mori, Hidetomo; Fujiwara, Mitsuru; and Matsunaga, Tetsuzo, 4,492,546, Cl. 418-201.000.
Fukukura, Kazutoyo, to AMP Incorporated. Key switch having an actuator integral with the return spring. 4,492,838, Cl. 200-159.00A.
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Oinoue, Kenichi; Hayashi, Asao; Nakamura, Junichi; Ida, Masatoshi; Aoki, Masahiro; and Fukuoka, Kenji, 4,492,449, Cl. 354-407.000.
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Miyakawa, Nobuhiro; Higashiguti, Teruaki; Sano, Yumiko; and Funato, Masatomi, 4,492,746, Cl. 430-71.000.
Funcik, Jack F.: *See*—
Schneider, Thomas E.; and Funcik, Jack F., 4,492,023, Cl. 29-861.000.
Fung, Shun C., to Exxon Research and Engineering Co. Low temperature decoking process for reactivating iridium and selenium containing catalysts. 4,492,767, Cl. 502-35.000.
Furst, Andor; Keller, Peter; and Muller, Marcel, to Hoffmann-La Roche Inc. deA-steroids. 4,492,797, Cl. 549-265.000.
Furutsu, Akira, to Japan Bano'k Co., Ltd. Fastener attacher. 4,492,330, Cl. 227-67.000.
Gabbay, Shlomo. Heart valve. 4,491,986, Cl. 3-1.500.
Gaddi, Roberto, to Fataluminium S.p.A. Centrifugal casting device. 4,492,264, Cl. 164-292.000.
Gajda, Robert S.: *See*—
Schatz, Jack M.; and Gajda, Robert S., 4,492,376, Cl. 272-138.000.
Gall, John C., to Sears, Roebuck and Co. Error correcting typewriter for simplified word obliteration. 4,492,485, Cl. 400-697.100.
Gall, Rudi: *See*—
Bosies, Elmar; Gall, Rudi; Weimann, Gunter; Bicker, Uwe; and Pahlke, Wulf, 4,492,659, Cl. 260-925.000.
Galperin, Alexander: *See*—
Clayton, Wilson A.; and Galperin, Alexander, 4,492,948, Cl. 338-25.000.
Ganem, Herve , to Thomson-CSF. Electronic antenna decoupling process and device. 4,493,111, Cl. 455-79.000.
Ganesan, Apparajan: *See*—
Fleischer, Paul E.; Ganesan, Apparajan; and Laker, Kenneth R., 4,492,935, Cl. 331-135.000.
Ganz-Mavag Mozdony-Vagon-es Gepgyar: *See*—
Csemniczky, Janos; and Jozsa, Istvan, 4,492,532, Cl. 417-360.000.

Ganzle, Hartmut: *See*—
Reule, Hans; Ganzle, Hartmut; and Vogel, Horst H., 4,492,894, Cl. 313-414.000.

Garaschenko, Vyacheslav I.: *See*—
Sandulyak, Alexandr V.; Garaschenko, Vyacheslav I.; and Yatskov, Nikolai V., 4,492,633, Cl. 210-223.000.
Sandulyak, Alexandr V.; Garaschenko, Vyacheslav I.; and Korkhov, Oleg J., 4,492,921, Cl. 324-204.000.

Garcia, Frank, Jr.; and Brown, David L., to Vetco Offshore, Inc. Valve seat with trapped O-ring. 4,492,362, Cl. 251-363.000.

Garczynski, John S.; Reed, Frank J.; Hahn, Jeffrey C.; and Dobson, John J., to Peripheral Dynamics, Inc. Badge reader with improved slide arrangement. 4,492,855, Cl. 235-458.000.

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Strekalou, Genrikhn; Shtyrin, Anatoly S.; Matveen, Viktor I.; Maryanchik, Mikhail A.; and Garibov, Genrikh S., 4,492,848, Cl. 219-127.000.

Gaschler, Michael: *See*—
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Gaskell, Lionel A.: *See*—
Schoenheimer, Marcus F.; Gaskell, Lionel A.; and Ackermann, Keith A., 4,492,219, Cl. 126-427.000.

Gasper, John S., to North American Van Lines, Inc. Frame fixture arrangement. 4,492,499, Cl. 410-32.000.

Gateway Plastics, Inc.: *See*—
Essen, R. Eric, 4,492,323, Cl. 222-465.00R.

Gaudyn, Tad J. Three dimensional projection arrangement. 4,492,442, Cl. 353-10.000.

Gauthier, Jean A.; and Jirkovsky, Ivo L., to Ayerst, McKenna & Harrison, Inc. 4H-Imidazo[2,3-c]pyrido[2,3-e][1,4]oxazine derivatives. 4,492,697, Cl. 424-248.400.

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Averbuch, Marie-Therese; Durif-Varambon, Andre ; Gauthier, Sylviane; Nicolau, Ion F.; and Peuzin, Jean C., 4,492,857, Cl. 250-211.00R.

Gavrin, Edward S.; Bratt, Richard G.; Schleimer, Stephen I.; Pilat, John F.; Richmond, Michael S.; Wallach, Walter A., Jr.; Belgard, Richard A.; Farber, David A.; Ahlstrom, John K.; Wallach, Steven J.; Clancy, Gerald F.; Mundie, Craig J.; Jones, Thomas M.; Bachman, Brett L.; and Bernstein, David H., to Data General Corporation. Digital data processing system having unique addressing means and means for identifying and accessing operands. 4,493,023, Cl. 364-200.000.

Gaylor, Marcia. Advertising display structure and sports facility. 4,492,049, Cl. 40-624.000.

Gebhard, Albert W., to Gerico, Inc. Infant security door gate assembly. 4,492,263, Cl. 160-228.000.

Gebhard Balluff Fabrik feinmechanischer Erzeugnisse GmbH & Co.: *See*—
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Geiger, Gerhard; and Strafner, Michael, to Siemens Aktiengesellschaft. Method and arrangement for the monitored transfer of control signals at interfaces of digital systems. 4,493,052, Cl. 364-900.000.

Geis, Robert J., to FMC Corporation. Conveyor chain retainer shoe. 4,492,304, Cl. 198-837.000.

Geller, Myer; Keenan, Thomas E.; Altman, Daniel E.; and Patterson, Richard H., to United States of America, Navy. Optical non-line-of-sight covert, secure high data communication system. 4,493,114, Cl. 455-617.000.

Gellert, Robert I.: *See*—
Erdmann, Joachim C.; and Gellert, Robert I., 4,492,465, Cl. 356-152.000.

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Chong, Ian, 4,492,261, Cl. 160-319.000.

General Dynamics, Pomona Division: *See*—
Yueh, William R., 4,492,352, Cl. 244-3.150.

General Electric Company: *See*—
Anderson, Thomas E.; Bush, Alvin A.; and Giorgis, John, 4,492,881, Cl. 307-270.000.
Aneja, Viney P., 4,492,807, Cl. 568-724.000.
Beall, Donald L.; Tomlinson, Harold W., Jr.; and Hart, William G., Jr., 4,493,105, Cl. 382-21.000.
Cline, Harvey E., 4,492,738, Cl. 428-611.000.
Cline, Harvey E., 4,492,739, Cl. 428-611.000.
Crouch, Donald W.; and Sofianek, Joseph C., 4,492,837, Cl. 200-144.00B.
DeLeeuw, Cornelius; and Blunt, Thomas O., 4,492,368, Cl. 269-32.000.
Dix, Joseph, 4,492,144, Cl. 89-33.170.
Evans, Edwin R.; and Clark, Robert F., 4,492,786, Cl. 524-865.000.
Johnson, Brian C., 4,493,032, Cl. 364-169.000.
Klompas, Nicholas, 4,492,517, Cl. 415-139.000.
Laskaris, Evangelos T., 4,492,090, Cl. 62-55.000.
Latter, Bruce B., 4,492,017, Cl. 29-434.000.
Mendiratta, Ashok K.; and Morgan, Wayne F., 4,492,806, Cl. 568-723.000.
Milkovic, Miran, 4,492,919, Cl. 324-127.000.
Near, Timothy P., 4,492,874, Cl. 290-40.00B.
Pardini, Franco P.; and De Vizzi, Francesco, 4,492,836, Cl. 200-144.00R.
Rieke, Richard J., 4,493,096, Cl. 378-99.000.
Stahl, Charles R.; and Perugi, Archie H., 4,492,085, Cl. 60-649.000.

General Electric Company p.l.c., The: *See*—
Barratt, Stuart; and Lumb, Anthony P., 4,493,030, Cl. 364-200.000.

General Foods Inc.: *See*—
Hewson, Gordon, 4,492,069, Cl. 53-436.000.

General Motors Corporation: *See*—
Graham, Donald E., 4,492,904, Cl. 318-444.000.
Herscheiman, Fredric A., 4,492,384, Cl. 277-237.00R.
Nowakowski, Robert J., 4,492,912, Cl. 320-6.000.
Sheldrake, Leonard J., 4,493,001, Cl. 361-92.000.

George, Pascal: *See*—
Kaplan, Jean-Pierre; George, Pascal; and Bernardon, Jean-Michel, 4,492,695, Cl. 424-246.000.

Georgia-Pacific Corporation: *See*—
Bannerman, Wyburn G.; and Ludwig, Charles H., 4,492,729, Cl. 428-283.000.

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Gesell, Reinhard: *See*—
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Schlusener, Horst; and Hesse, Norbert, 4,492,410, Cl. 299-43.000.

GfK Gesellschaft fur Kohleverflussigung mbH: *See*—
Wurfel, Helmut, 4,492,623, Cl. 208-10.000.

Gg. Noell GmbH: *See*—
Schafer, Hans; and Gaschler, Michael, 4,492,087, Cl. 62-45.000.

Ghisalba, Oreste; Heinzer, Franz; and Kuenzi, Martin, to Ciba-Geigy Corporation. Microorganisms of the genus Hyphomicrobium and process for degrading compounds wich contain methyl groups in aqueous solutions. 4,492,756, Cl. 435-253.000.

Gianotti, Tonio: *See*—
Koch, Dieter; and Gianotti, Tonio, 4,492,524, Cl. 417-18.000.

Gibbs, George R.: *See*—
Lapatovich, Walter P.; and Gibbs, George R., 4,492,898, Cl. 315-248.000.

Gibson, Donald D., to Ford Motor Company. Method for preparing blocks of glass for shipment. 4,492,071, Cl. 53-442.000.

Gilbertson, Thomas A. Hydraulic oil well pumping unit. 4,492,536, Cl. 417-401.000.

Gillette Company, The: *See*—
Jacobson, Chester F., 4,492,024, Cl. 30-87.000.
Jacobson, Chester F., 4,492,025, Cl. 30-87.000.

Gillier, Hugues; Redasse, Jean-Claude; and Renaut, Maurice, to Commissariat a l'Energie Atomique. Apparatus for the optical observation of phenomena in mixtures. 4,492,116, Cl. 73-432.00R.

Gillone, Walter: *See*—
Bovio, Michele; and Gillone, Walter, 4,493,038, Cl. 364-405.000.

Ginn, Ian D.; Gleave, Leonard; and Woods, Leslie, to Metal Box Public Limited Company. Apparatus for handling thin sheets of material. 4,492,135, Cl. 83-155.000.

Giolito, Silvio L., to Stauffer Chemical Company. Low temperature stable tert-butylphenyl diphenyl phosphate. 4,492,660, Cl. 260-966.000.

Giorgis, John: *See*—
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Giuliano, Concetto R.: *See*—
Jain, Ravinder K.; and Giuliano, Concetto R., 4,493,086, Cl. 372-21.000.

Giulio, Folli; and Marino, Casadei. Automatic machine for forming shaped pieces of dough. 4,492,553, Cl. 425-308.000.

Glander, Siegfried, to Hoechst Aktiengesellschaft. Process for the level exhaust dyeing of polyester fibers. 4,491,995, Cl. 8-158.000.

Glaser, Roger M.: *See*—
Petrofsky, Jerrold S.; Glaser, Roger M.; Phillips, Chandler A.; and Petrofsky, Steven H., 4,492,233, Cl. 128-421.000.

Glass, Roger W.: *See*—
Cheh, Christopher H.; and Glass, Roger W., 4,492,649, Cl. 252-630.000.

Gleave, Leonard: *See*—
Ginn, Ian D.; Gleave, Leonard; and Woods, Leslie, 4,492,135, Cl. 83-155.000.

Glenn, William M., Jr.: *See*—
Dulapa, Mark J.; and Glenn, William M., Jr., 4,492,119, Cl. 73-621.000.

Global Marine, Inc.: *See*—
Horton, Edward E., 4,492,270, Cl. 166-358.000.

Goko, Nobuaki: *See*—
Takashima, Ryokichi; Goko, Nobuaki; Uehara, Yumito; Nishihara, Yasuhiro; and Yamamoto, Hidetoshi, 4,492,787, Cl. 525-53.000.

Golan, Lawrence P.: *See*—
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Gold, Calman: *See*—
Prescott, Robert C.; Gold, Calman; and Anderson, Eric V., 4,492,246, Cl. 137-85.000.

Goldfarb, Adolph E.; and Everitt, Delmar K., to Goldfarb, Adolph E. Ultracompact miniature toy vehicle with four-wheel drive and unusual climbing capability. 4,492,058, Cl. 446-462.000.

Goldmann, Siegfried; Boshagen, Horst; Stoltefuss, Jurgen; Schramm, Matthias; Thomas, Gunter; and Kazda, Stanislav, to Bayer Aktiengesellschaft. 4-(2-Substituted phenyl)-1,4-dihydropyridine-3,5-dicarboxylic acid esters active on blood circulation. 4,492,703, Cl. 424-266.000.

Goldstein, Arnold S.: *See*—
Agers, Brian M.; and Goldstein, Arnold S., 4,492,009, Cl. 28-254.000.

Gomi, Haruo: *See*—
Kato, Masaaki; Miyoshi, Teruzo; Kibayashi, Iwao; Ikemi, Masahisa; Gomi, Haruo; Ishimatsu, Yoshiaki; Koizumi, Noriaki; and Yamada, Hideaki, 4,492,757, Cl. 435-280.000.

Goosen, Mattheus F. A.; and Sun, Anthony M. F., to Connaught Laboratories Limited. Slow release injectable insulin composition. 4,492,684, Cl. 424-19.000.

Gordon, Bruce E., to Raytheon Company. Memory system. 4,493,090, Cl. 375-4.000.

Gorecki, James L., to Honeywell Inc. JFET Monolithic integrated circuit with input bias current temperature compensation. 4,492,972, Cl. 357-22.000.

Gorman, Esther M.; and Gorman, William W., Jr., to E-C Apparatus Corporation. Field-test method and apparatus for the detection of asbestos. 4,492,759, Cl. 436-72.000.

Gorman, Robert R.: *See*—
Masaki, Ichiro; Shulman, Burt H.; and Gorman, Robert R., 4,492,847, Cl. 219-124.340.

Gorman, William W., Jr.: *See*—
Gorman, Esther M.; and Gorman, William W., Jr., 4,492,759, Cl. 436-72.000.

Goto, Tadahiko; Oniki, Kiyoshi; Murakami, Satoshi; Yokooji, Mitsunori; Andou, Norio; and Shimojyo, Norio, to Yaskawa Electric Mfg. Co., Ltd. Electric motor. 4,492,906, Cl. 318-488.000.

Gould, Gerald, to Perkin-Elmer Corporation, The. Method and means for making a beryllium mirror. 4,492,669, Cl. 419-5.000.

Gozzo, Franco: *See*—
Boschi, Pier M.; Gozzo, Franco; and Longoni, Angelo, 4,492,690, Cl. 424-200.000.

Graas, Rene ; and Fackelstein, Michel, to Arbed S.A. Apparatus for the paired connection of sheet piles with claws. 4,492,022, Cl. 29-787.000.

Grabowski, Paul P., to Kraft, Inc. Knock-down plastic cheese curing container. 4,492,153, Cl. 99-460.000.

Gradeff, Peter S.; and Schreiber, Fred G., to Rhone-Poulenc, Inc. Tricyclopentadienyl cerium and process for preparing the same. 4,492,655, Cl. 260-429.200.

Graham, Donald E., to General Motors Corporation. Windshield wiper system with touch control. 4,492,904, Cl. 318-444.000.

Gramckow, Jurgen. Method and apparatus for producing non-rhizoming grasses. 4,492,172, Cl. 111-1.000.

Great Neck Saw Manufacturing, Inc.: *See*—
Mayes, Daniel J., 4,492,038, Cl. 33-379.000.

Green, David T., to United States Surgical Corporation. Surgical clip applying apparatus having fixed jaws. 4,492,232, Cl. 128-325.000.

Green, Melvin E., to Advance Process Supply Co. Scoop coater. 4,492,486, Cl. 401-131.000.

Greene, Reginald S.: *See*—
Spencer, John E.; Greene, Reginald S.; and Fisher, Terrence L., 4,492,443, Cl. 354-121.000.

Greenwood, Leon D.; and Thorsen, Thomas A., to Eaton Stamping Company. Recoil starter. 4,492,190, Cl. 123-185.00A.

Gregory, William D., to President and Directors of Georgetown University. Apparatus and method for image reproduction of materials using their magnetic and electric properties. 4,493,039, Cl. 364-414.000.

Grieco, Steven E., to Motorola, Inc. Temperature compensation circuit for oscillator with parabolic characteristic. 4,492,933, Cl. 331-66.000.

Grisbrook, Robert B. Compressors efficiency improvement. 4,492,529, Cl. 417-242.000.

Gromov, Mikhail V.: *See*—
Belykh, Sergei I.; Moschensky, Anatoly D.; Davydov, Anatoly B.; Pershin, Gely G.; Smirnov, Boris A.; and Gromov, Mikhail V., 4,492,226, Cl. 128-92.0BC.

Grumman Emergency Products, Inc.: *See*—
Bilyeu, Delford D., 4,492,525, Cl. 417-34.000.

Grundig E.M.V.: *See*—
Zollner, Rainer, 4,492,351, Cl. 242-197.000.

Gruner, Ronald H.: *See*—
Baxter, Ward, II; Clancy, Gerald F.; Gruner, Ronald H.; Mundie, Craig J.; Bachman, Brett L.; Redfield, Stephen R.; Coder, William N.; Jones, Thomas M.; Houseman, David L.; Young, Charles J.; and Haeffele, Steven M., 4,493,024, Cl. 364-200.000.

Grunwald, Ronald P. Suture guide holder. 4,492,229, Cl. 128-303.00R.

Grynberg, Jack; Nelson, Leonard Y.; and Moody, Stephen E., to Mathematical Sciences Northwest, Inc. Method and apparatus for analyzing components of hydrocarbon gases recovered from oil, natural gas and coal drilling operations. 4,492,862, Cl. 250-255.000.

GTE Automatic Electric, Inc.: *See*—
Adams, Tello D., 4,493,092, Cl. 375-36.000.

GTE Business Communication Systems: *See*—
James, Miranda L.; and Teater, Albert, 4,492,823, Cl. 179-81.00R.

GTE Laboratories Incorporated: *See*—
Lapatovich, Walter P.; and Gibbs, George R., 4,492,898, Cl. 315-248.000.

GTE Products Corporation: *See*—
Buljan, Sergej-Tomislav, 4,492,765, Cl. 501-97.000.
Kuo, Samuel C., 4,492,964, Cl. 343-792.500.
Mickelson, Nils P.; and De LaChapelle, Richard P., 4,493,003, Cl. 361-119.000.
Snell, Richard G.; and Loughridge, Fredrick A., 4,492,814, Cl. 174-50.640.

Guess, Joe F.; and Pearce, Thomas, to Technicare Corporation. Pressurizing syringe. 4,492,317, Cl. 222-39.000.

Guillaume, Errick, to Hermes Precisa International S.A. Means for detecting the end of a ribbon for typewriters. 4,492,483, Cl. 400-208.000.

Guillon, Michel; Mondet, Jean; Papantoniou, Christos; and Vandenbossche, Claudine, to Societe Anonyme dite: L'Oreal. Cosmetic makeup containing colored pigments salified with amine functions. 4,492,686, Cl. 424-61.000.

Gulf Research & Development Company: *See*—
Kibby, Charles L.; and Kobylinski, Thaddeus P., 4,492,774, Cl. 518-713.000.

Gulf & Western Manufacturing Company: *See*—
Malesko, Michael W., 4,492,833, Cl. 200-61.780.

Gundry, Kenneth J., to Dolby Laboratories Licensing Corporation. Analog and digital signal apparatus. 4,493,091, Cl. 375-30.000.

Gunther, Dieter: *See*—
Bertsch, Richard; Gunther, Dieter; and Steinbrenner, Ulrich, 4,492,204, Cl. 123-489.000.

Haag, Laurent, to Eurofloor S.A. Composite product having a low-porosity support layer, and method of manufacture thereof. 4,492,606, Cl. 156-79.000.

Haar, Lucas H.: *See*—
Weiler, Rolf; Boehm, Peter; Haar, Lucas H.; and Timtner, Karlheinz, 4,492,081, Cl. 60-547.100.

Haas, George A.; Shih, Arnold; and Marrian, Christie R. K., to United States of America, Navy. Method for predicting the performance of cathode materials. 4,492,866, Cl. 250-305.000.

Haberfellner, Fritz; Mennicke, Stefan; and Prappacher, Gerd, to Brown, Boveri & Cie AG. Electrochemical storage cell. 4,492,742, Cl. 429-104.000.

Haddad, Theodore A.: *See*—
Phillips, Richard A.; and Haddad, Theodore A., 4,492,733, Cl. 428-412.000.

Haeffele, Steven M.: *See*—
Baxter, Ward, II; Clancy, Gerald F.; Gruner, Ronald H.; Mundie, Craig J.; Bachman, Brett L.; Redfield, Stephen R.; Coder, William N.; Jones, Thomas M.; Houseman, David L.; Young, Charles J.; and Haeffele, Steven M., 4,493,024, Cl. 364-200.000.

Hafner, V. Walter: *See*—
Morris, Earl L.; Hafner, V. Walter; and Hahn, Ron T., 4,492,430, Cl. 350-631.000.

Hagen, Rainer; and Hartwig, Jurgen, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method for separating ethanol from an ethanol containing solution. 4,492,808, Cl. 568-916.000.

Haginomori, Eiichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Gas-insulated switchgear. 4,493,008, Cl. 361-341.000.

Hahn, Jeffrey C.: *See*—
Garczynski, John S.; Reed, Frank J.; Hahn, Jeffrey C.; and Dobson, John J., 4,492,855, Cl. 235-458.000.

Hahn, Ron T.: *See*—
Morris, Earl L.; Hafner, V. Walter; and Hahn, Ron T., 4,492,430, Cl. 350-631.000.

Haines, Robert E., to Star Industries, Inc. Thrust rod anchor for pipe joint restraint systems. 4,492,391, Cl. 285-114.000.

Hainsworth, Thomas E., to Bell & Howell Company. Materials handling system. 4,492,504, Cl. 414-273.000.

Haisma, Jan: *See*—
Joosten, Paul H.; Popma, Theo J. A.; Nabben, Hendrikus J. P.; Van Hal, Henricus A. M.; and Haisma, Jan, 4,492,721, Cl. 427-226.000.

Hajianpour, Mohamad-Ali, to Diversified Medical Systems, Inc. Knee exercise machine. 4,492,222, Cl. 128-25.00R.

Halcomb, Ronald G., to Rockwell International Corporation. Method for producing integrally stiffened fiber reinforced plastic panels. 4,492,607, Cl. 156-242.000.

Hall, Duane O.: *See*—
Kennard, Lon H.; Hall, Duane O.; and Bangerter, Richard M., 4,492,820, Cl. 179-5.00P.

Hallberg, John E., to PetroSystems International, Inc. Dual fuel system. 4,492,207, Cl. 123-527.000.

Halliburton Company: *See*—
Mallett, A. J., 4,493,062, Cl. 367-32.000.
Smith, Harry D., Jr., 4,492,863, Cl. 250-256.000.

Hamamatsu Terebi Kabushiki Kaisha: *See*—
Tsuchiya, Yutaka; Inuzuka, Eiji; and Shinoda, Yuji, 4,492,879, Cl. 307-248.000.

Hamel, Howard L. Electrical line reversal and protection system. 4,492,878, Cl. 307-127.000.

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Hernandez, E. Norman; and Hammerquist, Eric M., 4,492,918, Cl. 324-83.00R.

Hammond, Charles W., to Babcock & Wilcox Company, The. Soot-blower apparatus. 4,492,187, Cl. 122-390.000.

Hanaoka, Masanori: *See*—
Ozaki, Tadashi; Hattori, Tadashi; Miura, Kazuhiko; Hanaoka, Masanori; and Hashiguchi, Yukihide, 4,492,109, Cl. 73-35.000.

Haneda, Satoshi; Itaya, Masahiko; and Tanaka, Minoru, to Knoishiroku Photo Industry Co. Ltd. Device for developing electrostatic latent images. 4,492,456, Cl. 355-3.0DD.

Hanel, Harold L.: *See*—
Benson, John; Hanel, Harold L.; and Freeman, Douglas A., 4,492,329, Cl. 227-10.000.

Haney, Keith M., to Walker-Neer Manufacturing Company Inc. Platform positioning system. 4,492,501, Cl. 414-22.000.

Hann, William; Bosin, Sanford D.; and White, Cecil. Plastic laminar digitally indexed dental die system. 4,492,578, Cl. 433-213.000.

Hansen, Peder M. Transmitting adaptive array antenna. 4,492,962, Cl. 343-369.000.

Hanson, Gustaf H., to Augusta Developments Inc. Orthodontic bracket. 4,492,573, Cl. 433-11.000.

Haque, Shahid: *See*—
Folkins, Jeffrey J.; Haque, Shahid; Loeb, Alfred M.; and Till, Henry R., 4,492,179, Cl. 118-689.000.
Hara, Akio; Miyake, Masaya; and Yazu, Shuji, to Sumitomo Electric Industries, Ltd. Process for the production of bonded hard alloys. 4,492,846, Cl. 219-121.0LC.
Harada, Nozomu, to Tokyo Shibaura Denki Kabushiki Kaisha. Solid state image-sensing device. 4,492,980, Cl. 358-213.000.
Harada, Shoji: *See*—
Oishi, Naoaki; Shimizu, Noriyuki; Shoji, Takashi; and Harada, Shoji, 4,492,730, Cl. 428-328.000.
Hargrave, Malcolm. Leaflet dispenser. 4,492,307, Cl. 206-449.000.
Harrington, Kent W.; Stevens, John L.; and Thorpe, Merle L., to TAFA Incorporated. Metal spray. 4,492,337, Cl. 239-81.000.
Harris Corporation: *See*—
Young, Lock R., 4,492,938, Cl. 333-111.000.
Harris, David J.; and Vinn, Charles L., to Raytheon Company. Digital-to-analog converter. 4,492,954, Cl. 340-347.0DA.
Hart, William G., Jr.: *See*—
Beall, Donald L.; Tomlinson, Harold W., Jr.; and Hart, William G., Jr., 4,493,105, Cl. 382-21.000.
Hartmann, Klaus: *See*—
Pross, Wilhelm; Barry, Jurgen; Muhlbock, Franz; and Hartmann, Klaus, 4,492,462, Cl. 356-39.000.
Hartwig, Carl S. M.; and van Nederkassel, Ludovicus J., to Institut Cerac S.A. Compressor drive system. 4,492,526, Cl. 417-45.000.
Hartwig, Jurgen, to Pfaff AG Haushaltsmaschinen. Device for controlling the drive of a stepping motor, to adjust the lateral stitch bight and/or the feed length of a sewing machine. 4,492,909, Cl. 318-696.000.
Hartwig, Jurgen: *See*—
Hagen, Rainer; and Hartwig, Jurgen, 4,492,808, Cl. 568-916.000.
Hasegawa, Hideo, to Nissan Motor Company, Limited. Shift lever for an automotive transmission. 4,492,129, Cl. 74-473.00R.
Hasegawa, Shumpei; and Yamato, Akihiro, to Honda Motor Co., Ltd. Device for intake air temperature-dependent correction of air/fuel ratio for internal combustion engines. 4,492,206, Cl. 123-491.000.
Hasegawa, Takashi; Tsuchihashi, Koji; and Yamashita, Hiroshi, to Mitsubishi Chemical Industries Limited. Process for producing carbon material for de-sulfurization from a binder with a blend of non-coking and coking coal. 4,492,771, Cl. 502-420.000.
Hashiguchi, Yukihide: *See*—
Ozaki, Tadashi; Hattori, Tadashi; Miura, Kazuhiko; Hanaoka, Masanori; and Hashiguchi, Yukihide, 4,492,109, Cl. 73-35.000.
Hashimoto, Kiyokazu; and Hayashi, Keizi, to Matsushita Electric Industrial Co., Ltd. Dropout compensation system. 4,492,988, Cl. 358-336.000.
Hashimoto, Shintaro; Morimoto, Masafumi; Nakanishi, Tosaku; Yoshida, Hideo; and Yanagiuchi, Shigenobu, to Sharp Kabushiki Kaisha. Electronic translator having removable voice data memory connectable to any one of terminals. 4,493,050, Cl. 364-900.000.
Hashizume, Hiroyuki: *See*—
Mochizuki, Norihiro; and Hashizume, Hiroyuki, 4,492,545, Cl. 418-149.000.
Hassib, Gabor: *See*—
Burgkhart, Bertram; Hassib, Gabor; and Piesch, Ernst, 4,492,872, Cl. 250-484.100.
Hatsuse, Toshikazu; and Kume, Kazunari, to Citizen Watch Co., Ltd. Small electronic timers. 4,492,479, Cl. 368-109.000.
Hattori, Tadashi: *See*—
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Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,492,515, Cl. 415-53.00T.
Hauenkalliontie 6 A 4: *See*—
Sairanen, Martti; and Virta, Matti, 4,492,897, Cl. 315-219.000.
Hawkins, Kenneth R. Shatter-proof lighting fixture. 4,493,013, Cl. 362-307.000.
Hawley, Gil R., to Phillips Petroleum Company. Polyolefin polymerization process and catalyst. 4,492,768, Cl. 502-111.000.
Hayakawa, Daishiro; Akimoto, Masao; Narita, Katsumi; and Tani, Kenroku, to Matsushita Electric Industrial Co., Ltd. Comb filter. 4,492,928, Cl. 330-126.000.
Hayakawa, Kizo: *See*—
Yamanaka, Teruo; Hayakawa, Kizo; Suzuki, Yasuhiko; and Esaki, Michiru, 4,492,114, Cl. 73-117.300.
Hayashi, Asao: *See*—
Oinoue, Kenichi; Hayashi, Asao; Nakamura, Junichi; Ida, Masatoshi; Aoki, Masahiro; and Fukuoka, Kenji, 4,492,449, Cl. 354-407.000.
Hayashi, Keizi: *See*—
Hashimoto, Kiyokazu; and Hayashi, Keizi, 4,492,988, Cl. 358-336.000.
Hayashi, Nobutoshi: *See*—
Takagi, Shigeru; and Hayashi, Nobutoshi, 4,492,079, Cl. 60-274.000.
Hayashi, Tsutomu, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for arranging oil pressure pump in motor-cycle. 4,492,284, Cl. 180-219.000.
Hayes, Allen L. Vaginal speculum protector. 4,492,220, Cl. 128-17.000.
Hayes, Ernest B.; and Cantell, Anthony S. Smoke filter. 4,492,240, Cl. 131-336.000.
Hayes, Richmond S., Jr.: *See*—
Jennings, William B.; Kozlowski, Robert M.; and Hayes, Richmond S., Jr., 4,492,269, Cl. 165-172.000.
Heath, Billy J.: *See*—
Thomas, Bobby J.; and Heath, Billy J., 4,493,067, Cl. 367-189.000.
Heath, Chester A., to International Business Machines Corporation. Dual mode I/O. 4,493,028, Cl. 364-200.000.
Hedrenius, Stig Erik T., to Sancon Aktiebolag. Method to clean up oil spills or similar substances and a device to practice this method. 4,492,001, Cl. 15-320.000.
Heep Tung Manufactory Limited: *See*—
Luk, Ka-Shiu, 4,492,318, Cl. 222-79.000.
Hegler, Ralph-Peter: *See*—
Hegler, Wilhelm; and Hegler, Ralph-Peter, 4,492,551, Cl. 425-144.000.
Hegler, Wilhelm; and Hegler, Ralph-Peter, to Hegler, Wilhelm. Apparatus for the production of plastic pipes with transverse grooves. 4,492,551, Cl. 425-144.000.
Heidelberger, Walter; and Morsch, Joachim, to bso Steuerungstechnik GmbH. Control mechanism. 4,492,128, Cl. 74-471.0XY.
Heijnen, Andreas T.: *See*—
Breuers, Theo P. C.; Heijnen, Andreas T.; and Leppink, Arie, 4,492,138, Cl. 83-203.000.
Heilig, Klemens: *See*—
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Heimberger, Helmut, to Optilon W. Erich Heilmann GmbH. Method of making a slide fastener coupling strip. 4,492,098, Cl. 66-202.000.
Heinemann Electric Company: *See*—
Nagel, Harry H., 4,492,941, Cl. 335-13.000.
Heinzer, Franz: *See*—
Ghisalba, Oreste; Heinzer, Franz; and Kuenzi, Martin, 4,492,756, Cl. 435-253.000.
Heiss, Lorenz, to Hoechst Aktiengesellschaft. Imines of alkyl 4-halomethylbenzoates. 4,492,657, Cl. 260-453.700.
Hellman, Bengt H.: *See*—
Colbert, Raymond O.; and Hellman, Bengt H., 4,492,876, Cl. 307-66.000.
Helm, John L., to Proto-Power Management Corporation. Steam generator sludge removal method. 4,492,186, Cl. 122-382.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Rutzen, Horst; Nikolaus, Peter; Bischoff, Martin; and Lehmann, Rudolf, 4,492,802, Cl. 564-292.000.
Henning, William F., II: *See*—
Scarlet, Richard I.; Andrews, James B.; and Henning, William F., II, 4,492,963, Cl. 343-464.000.
Herbruck, Steven L. Toilet cover attachment. 4,491,991, Cl. 4-661.000.
Hermes Precisa International S.A.: *See*—
Guillaume, Errick, 4,492,483, Cl. 400-208.000.
Hernandez, E. Norman; and Hammerquist, Eric M., to Terra Technology Corp. High voltage power line phase angle and current measuring instrument. 4,492,918, Cl. 324-83.00R.
Herriau, Jean-Pierre: *See*—
Huignard, Jean-Pierre; Herriau, Jean-Pierre; and Marrakchi El Fellah, Abdellatif, 4,492,468, Cl. 356-347.000.
Herschelman, Fredric A., to General Motors Corporation. Sealing arrangement. 4,492,384, Cl. 277-237.00R.
Hershey, Harold J.: *See*—
Brzezinski, Alex M.; Hershey, Harold J.; and Whitesell, Stephen R., 4,492,825, Cl. 179-111.00R.
Herve, Jean-Jacques; Suglia, Jean-Claude; and Meinard, Colette, to Roussel Uclaf. Light-stable pesticidal compositions. 4,492,687, Cl. 424-174.000.
Herzog, Walter: *See*—
Chmela, Franz; Herzog, Walter; and Meier, Richard, 4,492,194, Cl. 123-276.000.
Hesse, Norbert: *See*—
Schlusener, Horst; and Hesse, Norbert, 4,492,410, Cl. 299-43.000.
Hewson, Gordon, to General Foods Inc. Apparatus and method for flattening a pouch. 4,492,069, Cl. 53-436.000.
Hidemune, Naito: *See*—
Kenji, Kubota; Kouji, Fukunaga; Yasuzo, Kirita; and Hidemune, Naito, 4,492,531, Cl. 417-279.000.
Hieftje, Gary M.; and Shabushnig, John, to Indiana University Foundation. Device for the accurate dispensing of small volumes of liquid samples. 4,492,322, Cl. 222-420.000.
Higa, Yasusi: *See*—
Nakasone, Seiken; Miyagi, Sadao; Aragaki, Takehiko; and Higa, Yasusi, 4,492,601, Cl. 127-48.000.
Higashi, Yoshihiro, to Kabushiki Kaisha Komatsu Seisakusho. Control system for synchronizing combination press line. 4,492,901, Cl. 318-85.000.
Higashiguti, Teruaki: *See*—
Miyakawa, Nobuhiro; Higashiguti, Teruaki; Sano, Yumiko; and Funato, Masatomi, 4,492,746, Cl. 430-71.000.
Higashimura, Yutaka: *See*—
Fukushi, Keiji; Higashimura, Yutaka; Huzioka, Shinei; Iwaasa, Syuzou; and Kadotani, Kenzo, 4,492,889, Cl. 310-87.000.
Higashino, Shigenori, to Mitsubishi Denki Kabushiki Kaisha. Superconduction storage apparatus of electrical power. 4,493,014, Cl. 363-14.000.
Higuchi, Yoshiro: *See*—
Ito, Yasuro; Higuchi, Yoshiro; Tsuji, Masanori; Yamamoto, Yasuhiro; Tada, Hiroshi; Kuroha, Kenji; Nakamura, Takashi; and Tomikawa, Koichi, 4,492,478, Cl. 366-28.000.

Hikita, Mitsutaka, to Hitachi, Ltd. Acoustic surface-wave bandpass filter. 4,492,940, Cl. 333-194.000.
Hills, Marian E.: *See*—
Bottka, Nicholas; Lessoff, Howard; and Hills, Marian E., 4,492,434, Cl. 350-356.000.
Hirahashi, Akira: *See*—
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Hirai, Kentaro, to Shionogi & Co., Ltd. 2-Guanidino-4-hydroxymethylthiazole and derivatives thereof. 4,492,794, Cl. 548-193.000.
Hiramatsu, Akira, to Canon Kabushiki Kaisha. Single lens reflex camera with mirror operating mechanism. 4,492,453, Cl. 354-479.000.
Hirano, Hiroyuki: *See*—
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Hirao, Takashi: *See*—
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Hiratsuka, Kosai; Nakamura, Yoichi; Maruko, Morihisa; Matsuura, Yoshio; and Kurihara, Michio, to Hitachi, Ltd.; and Electric Power Development Co., Ltd. Method for agglomerating coal particles in pulp water. 4,492,638, Cl. 210-728.000.
Hirose, Tomonao, to Kohshin Seimitsu Kikai Kabushiki Gaisha. Detachable pressure foot with solenoid actuated securing device. 4,492,173, Cl. 112-240.000.
Hirsch, John L.; and Freitag, Ludwig W., to Curt G. Joa, Inc. Elastic band applicator and sheet folder. 4,492,608, Cl. 156-467.000.
Hisaka Works, Ltd.: *See*—
Uehara, Haruo; and Sumitomo, Hiroyuki, 4,492,268, Cl. 165-166.000.
Hislop, Alfred R., to United States of America, Navy. Switching mixer. 4,492,960, Cl. 343-5.0DD.
Hitachi Chemical Company, Ltd.: *See*—
Nakashima, Kazuhide; Saito, Takayuki; Nakahara, Takeshi; and Tanaka, Shigeo, 4,492,789, Cl. 525-531.000.
Hitachi, Ltd.: *See*—
Arai, Takao; and Noguchi, Takaharu, 4,492,997, Cl. 360-113.000.
Asano, Etuo; Suzuki, Yasuro; and Midou, Nobuo, 4,492,884, Cl. 310-45.000.
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Takano, Kazukiyo; and Koga, Keigi, 4,493,037, Cl. 364-405.000.
Taniguchi, Motoya; Ikeda, Minoru; and Komeyama, Yoshihiro, 4,492,356, Cl. 248-346.000.
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Hitachi Medical Corporation: *See*—
Suzuki, Atsushi; Yamada, Hiromichi; Uchida, Yoko; Kohno, Hideki; and Yoshida, Minoru, 4,492,869, Cl. 250-367.000.
Hitomi, Hisakazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Temperature-compensating bias circuit. 4,492,914, Cl. 323-313.000.
Hoagland, Dean W.: *See*—
Hoagland, Merle R.; Hoagland, Robert M.; and Hoagland, Dean W., 4,492,506, Cl. 414-463.000.
Hoagland, Merle R.; Hoagland, Robert M.; and Hoagland, Dean W., to DMB Enterprises, Inc. Under vehicle carrier for a spare wheel. 4,492,506, Cl. 414-463.000.
Hoagland, Robert M.: *See*—
Hoagland, Merle R.; Hoagland, Robert M.; and Hoagland, Dean W., 4,492,506, Cl. 414-463.000.
Hodges, Thomas J.: *See*—
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Hoechst Aktiengesellschaft: *See*—
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Esser, Karl; Stahl, Ulf; Tudzynski, Paul; and Kuck, Ulrich, 4,492,758, Cl. 435-317.000.
Glander, Siegfried, 4,491,995, Cl. 8-158.000.
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Merkel, Wulf; Bormann, Dieter; and Muschaweck, Roman, 4,492,710, Cl. 424-274.000.
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Sommer, Karl; and Armbrecht, Norbert, 4,492,653, Cl. 534-796.000.
Willms, Lothar; Huttelmaier, Thomas; Mildenberger, Hilmar; Bauer, Klaus; Burstell, Helmut; and Bieringer, Hermann, 4,492,598, Cl. 71-93.000.
Zimmerschied, Klaus; and Rinno, Helmut, 4,492,780, Cl. 524-45.000.
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Lange, Gerhard; Boy, Jurgen; Hoene, Ernst-Ludwig; and Sippekamp, Oskar, 4,493,006, Cl. 361-124.000.
Hoeren Gerd H.; and Palmquist, Steven R., to Tektronix. Apparatus and a method of establishing the correct display order of probe channels for a logic analyzer. 4,493,044, Cl. 364-579.000.
Hoffman, Robert A.; and Ip, Stephen H. C., to Ortho Diagnostics Systems Inc. Method for discriminating between unstained and absorbing dye stained cells. 4,492,752, Cl. 435-7.000.
Hoffmann-La Roche Inc.: *See*—
Furst, Andor; Keller, Peter; and Muller, Marcel, 4,492,797, Cl. 549-265.000.
Hoffmann, Matthias: *See*—
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Hoh, Bernhard: *See*—
Bathmann, Hans-Jurgen; Hoh, Bernhard; and Schulz, Siegmar, 4,492,118, Cl. 73-612.000.
Hohmann, Walter; and Wunderlich, Klaus, to Bayer Aktiengesellschaft. Vat dyestuffs of the trisanthraquinonylaminotriazine series. 4,492,790, Cl. 544-188.000.
Holberg, Douglas R., to Mostek Corporation. Offset voltage compensation circuit. 4,492,927, Cl. 330-9.000.
Holdstock, Barry C.: *See*—
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Holtermann, Ludwig K.: *See*—
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Ohmori, Yoshitaka; and Nebu, Hideaki, 4,492,250, Cl. 137-590.000.
Otani, Junji; Ikenoya, Yasuo; and Araki, Masafumi, 4,492,209, Cl. 123-568.000.
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Honda Motor Co., Ltd.: *See*—
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Honeywell Inc.: *See*—
Gorecki, James L., 4,492,972, Cl. 357-22.000.
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Honeywell Information Systems Inc.: *See*—
Angelle, Phillip A.; Porter, Marion G.; and King, James L., 4,493,034, Cl. 364-200.000.
Boudreau, Daniel A.; and Salas, Edward R., 4,493,036, Cl. 364-200.000.
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Hooper, Clinton E., to Pitney Bowes Inc. Mailing machine cut tape feed module. 4,492,315, Cl. 221-186.000.
Hopkins, Harold H., to National Research Development Corporation. Variable stereomicroscope. 4,492,441, Cl. 350-516.000.
Hopmayer, Gary S.; and Barone, Charles, to Mega International, Inc. Conductor separator, wiring harness, and rectifier assembly for an alternator including same. 4,493,018, Cl. 363-145.000.
Horie, Hideo: *See*—
Onada, Noboru; Kanamori, Akira; Kimura, Takashi; Moroto, Seiro; Horie, Hideo; and Yoshizoe, Teruhide, 4,492,991, Cl. 360-70.000.
Horie, Masakatsu: *See*—
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Horiike, Yasuhiro: *See*—
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Horodysky, Andrew G.; and Kaminski, Joan M., to Mobil Oil Corporation. Trihydroxyhydrocarbyl sulfides and lubricants containing same. 4,492,640, Cl. 252-46.300.
Horodysky, Andrew G., to Mobil Oil Corporation. Ammoniated borated epoxides and lubricants and fuels containing same. 4,492,642, Cl. 252-49.600.
Horr, Alfred: *See*—
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Horton, Edward E., to Global Marine, Inc. Method of installing and using offshore well development and production platforms. 4,492,270, Cl. 166-358.000.
Horwath, Robert O.; and Colonna, William J., to Nabisco Brands, Inc. Process for isomerizing L-mannose to L-fructose. 4,492,755, Cl. 435-94.000.
Hosid, Jack B.: *See*—
Burke, James E., 4,492,223, Cl. 128-57.000.
Hotaka Engineering Co., Ltd.: *See*—
Saitoh, Kazunori, 4,492,567, Cl. 432-30.000.
Hotchkiss-Brandt Sogeme H.B.S.: *See*—
Divoux, Michel; Bonansea, Hubert; and Constant, Bernard, 4,492,509, Cl. 414-387.000.
Hotten, Terrence M.: *See*—
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Hounsel, Mack A., to J. T. Thorpe Company. Refractory fiber ladle preheater sealing rings. 4,492,382, Cl. 277-12.000.
Houseman, David L.: *See*—
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Howe, Arthur T., to Standard Oil Company (Indiana). Multilayer photoelectrodes and photovoltaic cells. 4,492,743, Cl. 429-111.000.
Hoyer, Ernst; Kohlhaas, Folker; and Meininger, Fritz, to Hoechst Aktiengesellschaft. Water-solubie azo compounds, a process for their preparation and their use as dyes. 4,492,654, Cl. 534-827.000.
Huang, Barney K.: *See—*
Chao, Allen C.; Huang, Barney K.; and Wang, James S. J., 4,492,039, Cl. 34-4.000.
Hubert, Warren N., to RJR Archer, Inc. Machinery for molding headpiece for collapsible tube including a chilled wiper. 4,492,548, Cl. 425-113.000.
Huether, Werner: *See—*
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Hughes Aircraft Company: *See—*
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Cobb, Jack M., 4,492,020, Cl. 29-600.000.
Jain, Ravinder K.; and Giuliano, Concetto R., 4,493,086, Cl. 372-21.000.
Valley, George C., 4,493,085, Cl. 372-19.000.
Hughes, John H., Jr., to Fairchild Camera & Instrument Corp. Test vector indexing method and apparatus. 4,493,045, Cl. 364-580.000.
Hughes, John H., Jr., to Fairchild Camera & Instrument Corp. Method and system for selectively loading test data into test data storage means of automatic digital test equipment. 4,493,079, Cl. 371-27.000.
Hughes Tool Company: *See—*
Knox, Dick L., 4,492,523, Cl. 417-13.000.
Leighton, Joseph C., 4,492,278, Cl. 175-410.000.
Huignard, Jean-Pierre; Herriau, Jean-Pierre; and Marrakchi El Fellah, Abdellatif, to Thomson-CSF. Interferometer for the real time display of deformations of vibrating structures. 4,492,468, Cl. 356-347.000.
Hund, Franz: *See—*
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Hunt, Donald E., to Ballwin-Washington, Inc. Serviceable valve construction. 4,492,210, Cl. 123-568.000.
Huttelmaier, Thomas: *See—*
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I. W. Industries, Inc.: *See—*
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Ibiden Co., Ltd.: *See—*
Yasuda, Haruo; Yoshida, Kunihiko; Iwai, Yasuro; and Mizutani, Takayuki, 4,492,850, Cl. 219-145.210.
Ibrahim, El-Eraky A.; and Eckels, Phillip W., to Westinghouse Electric Corp. Radiation shield with helical fluid passages. 4,492,088, Cl. 62-55.000.
Ibuki Kogyo Co., Ltd.: *See—*
Shintaku, Yoshishige, 4,492,827, Cl. 179-115.5SF.
Ichikawa, Souji, to Mitutoyo Mfg. Co., Ltd. Linear scale type displacement measuring instrument. 4,492,033, Cl. 33-125.00C.
ICI Pharma: *See—*
Jung, Frederic H.; and Davies, Gareth M., 4,492,692, Cl. 424-246.000.
ID-Energiesysteme Gesellschaft m.b.H.: *See—*
Schwarz, Alois, 4,492,093, Cl. 62-238.600.
Ida, Masatoshi: *See—*
Oinoue, Kenichi; Hayashi, Asao; Nakamura, Junichi; Ida, Masatoshi; Aoki, Masahiro; and Fukuoka, Kenji, 4,492,449, Cl. 354-407.000.
Igarashi, Kouhei; and Tomita, Kazuo, to Toyota Jidosha Kabushiki Kaisha. Optimum shift position indicating device of vehicle. 4,492,112, Cl. 73-117.300.
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Tanaka, Osamu; Watanabe, Noboru; and Iiyama, Hiroshi, 4,492,029, Cl. 33-366.000.
Ikeda, Masayuki, to Kabushiki Kaisha Suwa Seikosha. Synchronizing circuit for matrix television set. 4,492,979, Cl. 358-153.000.
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Imaya, Akihiko; and Kitamura, Susumu, to Sharp Kabushiki Kaisha. In-fem liquid crystal display panel with a film of cellophane tape. 4,492,433, Cl. 350-339.00R.
Immudx, Inc.: *See—*
Shell, William E.; Burnam, Michael H.; and Tokes, Zoltan A., 4,492,753, Cl. 435-17.000.
Imperial Chemical Industries PLC: *See—*
Davies, Gwilym R., 4,492,617, Cl. 204-73.00R.
Jung, Frederic H.; and Davies, Gareth M., 4,492,692, Cl. 424-246.000.
Inaba, Hajimu; and Torii, Nobutoshi, to Fujitsu Fanuc Limited. Workpiece feeder. 4,492,301, Cl. 198-472.000.
Inami, Mamoru; Tanaka, Yoshiaki; and Ohtsuki, Zenju, to Victor Company of Japan, Ltd. Display device for displaying audio signal levels and characters. 4,492,917, Cl. 324-77.00A.
Indiana University Foundation: *See—*
Hieftje, Gary M.; and Shabushnig, John, 4,492,322, Cl. 222-420.000.
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Martin, Marshal H., 4,492,899, Cl. 315-308.000.
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Bovio, Michele; and Gillone, Walter, 4,493,038, Cl. 364-405.000.
Ingeniorfirmaet Lytzen KS: *See—*
Vestergaard, Alex D., 4,492,569, Cl. 432-72.000.
Ingram, Wayne A.: *See—*
Luke, Roger D.; Ingram, Wayne A.; and Jarrell, Michael S., 4,492,396, Cl. 292-228.000.
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Boyanton, Walter L., 4,492,364, Cl. 256-47.000.
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Insley, Gene L.; Seaburg, Duane M.; and Pearce, Daniel S., to Quaker Oats Company, The. Phonograph. 4,493,069, Cl. 369-75.100.
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Hartwig, Carl S. M.; and van Nederkassel, Ludovicus J., 4,492,526, Cl. 417-45.000.
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Lee, Francis C.; Mills, Ross N.; Niweigha, Tiefa K.; and Talke, Frank E., 4,492,968, Cl. 346-140.00R.
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Anantha, Narasipur G.; Ning, Tak H.; and Tsang, Paul J., 4,492,008, Cl. 29-571.000.
Brezzo, Bernard; Calvignac, Jean; Dambricourt, Richard; Masclet, Andre; and Sanche, Jean-Pierre, 4,493,051, Cl. 364-900.000.
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Heath, Chester A., 4,493,028, Cl. 364-200.000.
Koopman, Nicholas G.; and Marcotte, Vincent C., 4,492,842, Cl. 219-85.00M.
Mao, Robert S., 4,493,056, Cl. 365-149.000.
Olnowich, Howard T., 4,493,026, Cl. 364-200.000.
Pliskin, William A.; and Riseman, Jacob, 4,492,717, Cl. 427-96.000.
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Schweighardt, Frank K., 4,492,674, Cl. 422-101.000.
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Farhangi, Hassan; Miles, Peter R.; and Daskalakis, Costas N., 4,493,106, Cl. 382-41.000.
International Flavors & Fragrances Inc.: *See—*
Sprecker, Mark A.; Klemarczyk, Philip T.; and Belko, Robert P., 4,492,645, Cl. 252-522.00R.
International Standard Electric Corporation: *See—*
Koller, Wilhelm J.; and Vogel, Horst, 4,492,961, Cl. 343-7.300.
Reule, Hans; Ganzle, Hartmut; and Vogel, Horst H., 4,492,894, Cl. 313-414.000.
Stockle, Bernd; and Pfendler, Klaus, 4,492,908, Cl. 318-663.000.
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Benson, John; Hanel, Harold L.; and Freeman, Douglas A., 4,492,329, Cl. 227-10.000.
Interstate Electronics Corporation: *See—*
Marentic, Michael J., 4,492,957, Cl. 340-777.000.
Inui, Toshiharu, to Fuji Xerox Co., Ltd. Ink donor sheet. 4,492,727, Cl. 428-216.000.
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Tsuchiya, Yutaka; Inuzuka, Eiji; and Shinoda, Yuji, 4,492,879, Cl. 307-248.000.
Inventio AG: *See—*
Schroder, Joris, 4,492,288, Cl. 187-29.00R.
Ip, Stephen H. C.: *See—*
Hoffman, Robert A.; and Ip, Stephen H. C., 4,492,752, Cl. 435-7.000.
Irex Corporation: *See—*
Lewis, George K.; Sun, Franklin K.; Keene, Douglas L.; and Fidel, Howard F., 4,492,120, Cl. 73-625.000.
Isaacson, Milton S.: *See—*
Knight, John H.; and Isaacson, Milton S., 4,492,903, Cl. 318-341.000.
Iscar Ltd.: *See—*
Pano, Joseph, 4,492,140, Cl. 83-839.000.
Ishihara, Shin-ichiro; Hirao, Takashi; Mori, Koshiro; and Mochizuki, Motonori, to Matsushita Electric Industrial Co., Ltd. Method of making photovoltaic device. 4,492,605, Cl. 148-174.000.
Ishihara, Shoichi; Yoneno, Hiroshi; and Yamamoto, Ryoichi, to Matsushita Electric Industrial Co., Ltd. Composite thermal insulator. 4,492,725, Cl. 428-69.000.
Ishii, Takashi. Three-tape type zipper. 4,492,006, Cl. 24-382.000.
Ishikawa, Norio; and Omaki, Takanobu, to Minolta Camera Kabushiki Kaisha. Automatic focusing device for use in a camera. 4,492,448, Cl. 354-406.000.
Ishimatsu, Yoshiaki: *See—*
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Isogai, Hideaki, to Fujitsu Limited. Circuit and method for writing in a semiconductor memory device. 4,493,059, Cl. 365-190.000.

Isomura, Shigenori: *See*—
Muramatsu, Toshihiko; Kobayashi, Akio; Kondo, Toshio; Isomura, Shigenori; and Eino, Tomomi, 4,492,202, Cl. 123-478.000.

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Yamada, Yukio; Itahana, Hiroshi; and Kuwana, Hisashi, 4,492,975, Cl. 357-76.000.

Italimpianti Societa Italiana Impianti P.A.: *See*—
Feroldi, Bruno, 4,492,565, Cl. 432-11.000.

Itaya, Masahiko: *See*—
Haneda, Satoshi; Itaya, Masahiko; and Tanaka, Minoru, 4,492,456, Cl. 355-3.0DD.

Ito, Mitsuo: *See*—
Yoshida, Isao; Okabe, Takeaki; Katsueda, Mineo; Nagata, Minoru; Masuhara, Toshiaki; Ashikawa, Kazutoshi; Kato, Hideaki; Ito, Mitsuo; Ohtaka, Shigeo; Minato, Osamu; and Sakai, Yoshio, 4,492,974, Cl. 357-23.000.

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Ito, Yasuro; Higuchi, Yoshiro; Tsuji, Masanori; Yamamoto, Yasuhiro; Tada, Hiroshi; Kuroha, Kenji; Nakamura, Takashi; and Tomikawa, Koichi, to Ito, Yasuro; and Taisei Corporation. Method and apparatus for applying mortar or concrete. 4,492,478, Cl. 366-28.000.

ITT Industries, Inc.: *See*—
Adam, Fritz G., 4,493,058, Cl. 365-189.000.
Belart, Juan, 4,492,082, Cl. 60-589.000.
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; and Weise, Lutz, 4,492,413, Cl. 303-92.000.
Weiler, Rolf; Boehm, Peter; Haar, Lucas H.; and Timtner, Karlheinz, 4,492,081, Cl. 60-547.100.

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Arff, Heino, 4,492,047, Cl. 36-134.000.

Ivanov, Andrei S.: *See*—
Dmitriev, Stanislav P.; Ivanov, Andrei S.; Sviniin, Mikhail P.; and Fedotov, Mikhail T., 4,492,873, Cl. 250-492.300.

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Kammiller, Neil A.; and Ivanov, Nedyalko V., 4,493,017, Cl. 363-132.000.

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Fukushi, Keiji; Higashimura, Yutaka; Huzioka, Shinei; Iwaasa, Syuzou; and Kadotani, Kenzo, 4,492,889, Cl. 310-87.000.

Iwai, Yasuro: *See*—
Yasuda, Haruo; Yoshida, Kunihiko; Iwai, Yasuro; and Mizutani, Takayuki, 4,492,850, Cl. 219-145.210.

Iwaki, Akio: *See*—
Yamamoto, Takeshi; Suzuki, Norihito; Aoki, Toru; and Iwaki, Akio, 4,492,740, Cl. 428-629.000.

Iwamoto, Tomio: *See*—
Sunago, Katsuyoshi; and Iwamoto, Tomio, 4,492,230, Cl. 128-303.100.

Iwamoto, Yoshinao: *See*—
Izawa, Toshio; Iwamoto, Yoshinao; Shirasaki, Yuichi; and Asakawa, Kenichi, 4,492,492, Cl. 405-160.000.

Iwata, Noboru, to Daiichi Engineering Co., Ltd. Squeeze pump. 4,492,538, Cl. 417-477.000.

Izawa, Toshio; Iwamoto, Yoshinao; Shirasaki, Yuichi; and Asakawa, Kenichi, to Kokusai Denshin Denwa Co., Ltd. Guiding method for cable burying device and a device therefor. 4,492,492, Cl. 405-160.000.

Izu, Masatsugu: *See*—
Ovshinsky, Herbert C.; and Izu, Masatsugu, 4,492,181, Cl. 118-718.000.
Ovshinsky, Stanford R.; and Izu, Masatsugu, 4,492,810, Cl. 136-255.000.

J. C. Renfroe and Sons, Inc.: *See*—
Renfroe, Charles J.; and Davies, William, 4,492,401, Cl. 294-101.000.

J. T. Thorpe Company: *See*—
Hounsel, Mack A., 4,492,382, Cl. 277-12.000.

Jaakonmaki, Matti; and Raura, Pentti, to Rauma-Repola Oy. Wood chip shaving machine. 4,492,343, Cl. 241-95.000.

Jackson, Leigh F.: *See*—
Pilgrim, Lawrence G., Jr.; and Jackson, Leigh F., 4,492,668, Cl. 376-440.000.

Jacobs, Anthony S.; Riley, James E.; and Christman, Jon D., to Wessel Company, Inc., The. Combined airline ticket holder and advertising booklet. 4,492,390, Cl. 281-31.000.

Jacobs, John J.: *See*—
Kuhn, Gerhard; and Jacobs, John J., 4,492,127, Cl. 74-50.000.

Jacobson, Chester F., to Gillette Company, The. Razor blade assembly. 4,492,024, Cl. 30-87.000.

Jacobson, Chester F., to Gillette Company, The. Razor handle assembly. 4,492,025, Cl. 30-87.000.

Jacquet, Maurice; and Le Du, Jean-Claude, to Valeo. Flap for air flow control in vehicle heating and cooling systems. 4,492,361, Cl. 251-356.000.

Jain, Ravinder K.; and Giuliano, Concetto R., to Hughes Aircraft Company. Synchronously-pumped phase-conjugate laser. 4,493,086, Cl. 372-21.000.

James, Miranda L.; and Teater, Albert, to GTE Business Communication Systems. Dual timing circuit for telephone subscriber's instrument. 4,492,823, Cl. 179-81.00R.

Janutka, William J., to Eaton Corporation. Unpowered fast gate turnoff FET. 4,492,883, Cl. 307-571.000.

Japan Bano'k Co., Ltd.: *See*—
Furutsu, Akira, 4,492,330, Cl. 227-67.000.

Jarrell, Michael S.: *See*—
Luke, Roger D.; Ingram, Wayne A.; and Jarrell, Michael S., 4,492,396, Cl. 292-228.000.

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Kramer, Wolfgang; Jautelat, Manfred; and Kranz, Eckart, 4,492,795, Cl. 548-341.000.

Jaynes, Mark S.: *See*—
Kahil, John E.; Jaynes, Mark S.; and Bradfield, James E., 4,492,115, Cl. 73-151.000.

Jeco Company Limited: *See*—
Tanaka, Osamu; Watanabe, Noboru; and Iiyama, Hiroshi, 4,492,029, Cl. 33-366.000.

Jelvestam, Roland E.; and Bergstrom, Par-Halan. Device for measuring concentration of particles conveyed by a liquid. 4,492,868, Cl. 250-345.000.

JENAer Glaswerk Schott & Gen.: *See*—
Scheidler, Herwig, 4,492,217, Cl. 126-39.00B.

Jenkins, Evans M., to Apollo Chemical Corporation. Transfer printing process for cellulose fabric. 4,492,584, Cl. 8-471.000.

Jennings, William B.; Kozlowski, Robert M.; and Hayes, Richmond S., Jr., to Carrier Corporation. Tube support assembly for a heat exchanger. 4,492,269, Cl. 165-172.000.

Jensen, Arthur S.; and Stull, Keefer S., Jr., to Westinghouse Electric Corp. Integrated circuit for chip op/amp interface. 4,492,882, Cl. 307-497.000.

Jensen, Borge: *See*—
Rasmussen, Ole-Bendt; and Jensen, Borge, 4,492,549, Cl. 425-131.100.

Jensen, Thomas C., to Deere & Company. Tillage implement and improved gang assembly therefor. 4,492,272, Cl. 172-178.000.

Jensen, Uffe L.; and Mortensen, Sten, to A/S Niro Atomizer. Method and apparatus for drying a pulverulent or particulate product. 4,492,040, Cl. 34-10.000.

Jetform Heisakanalnormalien und Zubehor GmbH, Firma: *See*—
Schulte, Wolfgang, 4,492,555, Cl. 425-548.000.

Jidosha Kiki Co., Ltd.: *See*—
Arino, Masao; and Koyama, Teruo, 4,492,249, Cl. 137-515.000.

Jirkovsky, Ivo L.: *See*—
Gauthier, Jean A.; and Jirkovsky, Ivo L., 4,492,697, Cl. 424-248.400.

John Zink Company: *See*—
Schwartz, Robert E.; and Keller, Michael R., 4,492,558, Cl. 431-4.000.

Johnson, Axel R.; Narayanan, Swami; and Woebcke, Herman N., to Stone & Webster Engineering Corp. Duocracking process for the production of olefins from both heavy and light hydrocarbons. 4,492,624, Cl. 208-78.000.

Johnson, Benjamin A. Digital meter using calculator components. 4,492,916, Cl. 324-60.0CD.

Johnson, Brian C., to General Electric Company. Method and apparatus for positioning using circular interpolation. 4,493,032, Cl. 364-169.000.

Johnson, Clark E., Jr., to Vertimag Systems Corporation. Noise reduction system. 4,492,990, Cl. 360-32.000.

Johnson, David E. Sail boom tent. 4,492,175, Cl. 114-39.000.

Johnson, Gerald L.; Nolting, Eugene C.; and Allen, John H., to Banc-Tec, Incorporated. High speed document encoding system. 4,492,161, Cl. 101-109.000.

Johnson, Gordon E.: *See*—
Law, Kock-Yee; Johnson, Gordon E.; and Lin, John W. P., 4,492,750, Cl. 430-494.000.

Johnson, John J.: *See*—
Baile, George H.; and Johnson, John J., 4,492,415, Cl. 384-463.000.

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Denton, Robert K., Jr.; and Kumar, Narayan G., 4,492,777, Cl. 523-115.000.

Jolley, Michael E.: *See*—
Wang, Chao-Huei J.; Stroupe, Stephen D.; and Jolley, Michael E., 4,492,762, Cl. 436-537.000.

Jones, David G.; and Kwon, Oh K. Wear analysis equipment. 4,492,461, Cl. 356-38.000.

Jones, Thomas M.: *See*—
Baxter, Ward, II; Clancy, Gerald F.; Gruner, Ronald H.; Mundie, Craig J.; Bachman, Brett L.; Redfield, Stephen R.; Coder, William N.; Jones, Thomas M.; Houseman, David L.; Young, Charles J.; and Haeffele, Steven M., 4,493,024, Cl. 364-200.000.
Gavrin, Edward S.; Bratt, Richard G.; Schleimer, Stephen I.; Pilat, John F.; Richmond, Michael S.; Wallach, Walter A., Jr.; Belgard, Richard A.; Farber, David A.; Ahlstrom, John K.; Wallach, Steven J.; Clancy, Gerald F.; Mundie, Craig J.; Jones, Thomas M.; Bachman, Brett L.; and Bernstein, David H., 4,493,023, Cl. 364-200.000.

Joosten, Paul H.; Popma, Theo J. A.; Nabben, Hendrikus J. P.; Van Hal, Henricus A. M.; and Haisma, Jan, to U.S. Philips Corporation. Method of providing magnesium fluoride layers. 4,492,721, Cl. 427-226.000.

Jou, W. F.; and Chen, C. N. Safety socket with easy fuse replacement device. 4,492,945, Cl. 337-229.000.

Jouve, Hubert: *See*—
Boshra-Riad, Mokhtar; Fedeli, Jean-Marc; Jouve, Hubert; and Mauduit, Daniel, 4,493,054, Cl. 365-36.000.
Jozsa, Istvan: *See*—
Csenniczky, Janos; and Jozsa, Istvan, 4,492,532, Cl. 417-360.000.
Jullien, Graham A., to Ogilvy, James J. Electronic candle system. 4,492,896, Cl. 315-153.000.
Jundt, Werner; and Reischl, Rolf. Method of controlling the air-fuel ratio in an internal combustion engine. 4,492,205, Cl. 123-489.000.
Jung, Frederic H.; and Davies, Gareth M., to Imperial Chemical Industries PLC; and ICI Pharma. Cephalosporin derivatives. 4,492,692, Cl. 424-246.000.
Jung, Gerd: *See*—
Kutz, Heinrich; Osdinning, Gunter; and Jung, Gerd, 4,492,105, Cl. 72-302.000.
Junior, Kenneth E.; and Byrd, James D., to Thiokol Corporation. Aramid polymer and powder filler reinforced elastomeric composition for use as a rocket motor insulation. 4,492,779, Cl. 523-138.000.
Kabelmetal Electro GmbH: *See*—
Rohner, Peter; Schippl, Klaudieter; Blumenberg, Gunther; Meyer, Werner; and Obert, Wolfgang, 4,492,089, Cl. 62-55.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Higashi, Yoshihiro, 4,492,901, Cl. 318-85.000.
Kuromoto, Kazunori, 4,492,148, Cl. 91-523.000.
Kabushiki Kaisha Saginomiya Seisakusho: *See*—
Kanai, Yoshikazu, 4,492,252, Cl. 137-625.430.
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Akazawa, Hiroyuki; and Yoshiie, Kazue, 4,492,484, Cl. 400-248.000.
Ikeda, Masayuki, 4,492,979, Cl. 358-153.000.
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Kadotani, Kenzo: *See*—
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Kagehiro, Ken. Shotgun recoil reducer. 4,492,050, Cl. 42-1.00V.
Kahil, John E.; Jaynes, Mark S.; and Bradfield, James E., to PA Incorporated. Method and apparatus for measuring defects in ferromagnetic tubing. 4,492,115, Cl. 73-151.000.
Kajitani, Koichi: *See*—
Tanaka, Taku; Maruyama, Hitoshi; Okaya, Takuji; and Kajitani, Koichi, 4,492,783, Cl. 524-430.000.
Kali-Chemie AG: *See*—
Buchwald, Hans; and Raschkowski, Boleslaus, 4,492,641, Cl. 252-48.400.
Kalkbrenner, Ralph W.: *See*—
Kobuck, Richard M.; Miller, Richard A.; Kalkbrenner, Ralph W.; Kerrey, John S.; and Duncan, Robert, 4,492,844, Cl. 219-121.0LC.
Kallai-Sanfacon, Mary-Ann, to American Home Products Corporation. Method of lowering lipid levels. 4,492,706, Cl. 424-270.000.
Kamai, Toshimitsu: *See*—
Kono, Takashi; Minegishi, Akira; and Kamai, Toshimitsu, 4,492,986, Cl. 358-330.000.
Kamimura, Tetsuro; and Matsuki, Seiichiro, to Pioneer Electronic Corporation. Cassette tape recorder. 4,492,998, Cl. 360-132.000.
Kaminski, Joan M.: *See*—
Horodysky, Andrew G.; and Kaminski, Joan M., 4,492,640, Cl. 252-46.300.
Kammerer, Heinz; and Langheinrich, Hans, to Gebhard Balluff Fabrik feinmechanischer Erzeugnisse GmbH & Co. Testing and evaluating circuit for proximity switches in machine control means. 4,492,925, Cl. 324-418.000.
Kammiller, Neil A.; and Ivanov, Nedyalko V., to Reliance Electric Company. Single drive transformer with regenerative winding for p.w.m. supply having alternately conducting power devices. 4,493,017, Cl. 363-132.000.
Kamp, Anthony W., to Shell Oil Company. Down-hole drilling motor and method for directional drilling of boreholes. 4,492,276, Cl. 175-61.000.
Kan, Yasuhito; and Miyamoto, Koichi, to Canon Kabushiki Kaisha. Feeding device. 4,492,371, Cl. 271-21.000.
Kana, Eugene J.: *See*—
Woods, Arthur F.; Bush, Harry; and Kana, Eugene J., 4,492,392, Cl. 285-119.000.
Kanai, Tamaki; Yoshikawa, Hirofumi; Yamagishi, Takashi; Suzuki, Kenji; and Ohta, Yoshikatsu, to Teijin, Limited. Process for the production of slippery biaxially stretched polyester films. 4,492,719, Cl. 427-171.000.
Kanai, Yoshikazu, to Kabushiki Kaisha Saginomiya Seisakusho. Reversible valve for reversible refrigeration cycle. 4,492,252, Cl. 137-625.430.
Kanamori, Akira: *See*—
Osada, Noboru; Kanamori, Akira; Kimura, Takashi; Moroto, Seiro; Horie, Hideo; and Yoshizoe, Teruhide, 4,492,991, Cl. 360-70.000.
Kanda, Yoichi: *See*—
Aoki, Katsumichi; Kanda, Yoichi; Satake, Keigo; and Shinkawa, Hiroyasu, 4,492,597, Cl. 71-92.000.
Kanno, Isao: *See*—
Yamamoto, Yasuo; and Kanno, Isao, 4,492,197, Cl. 123-630.000.
Kantorowich, Roy H., to Victoria University of Manchester, The. Mortice and tenon joint. 4,492,489, Cl. 403-319.000.
Kaplan, Jean-Pierre; George, Pascal; and Bernardon, Jean-Michel, to Synthelabo. Therapeutically useful imidazo[1,2-a]pyridine derivatives. 4,492,695, Cl. 424-246.000.
Kaplan, Martin L., to AT&T Laboratories. Reactions of aromatic compounds having two or more fused rings. 4,492,652, Cl. 568-75.000.
Kariya, Izumi: *See*—
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Karmell, Yale: *See*—
Pala, Jerome; Karmell, Yale; and Muzyczko, Thaddeus M., 4,492,012, Cl. 29-148.40D.
Karwat, Heinz: *See*—
Baur, Karl; and Karwat, Heinz, 4,492,676, Cl. 423-210.000.
Kaser, Peter: *See*—
Mizrah, Tiberiu; Hoffmann, Matthias; Kaser, Peter; and Heilig, Klemens, 4,492,670, Cl. 419-9.000.
Kastner, Ralph E.: *See*—
Michel, Karl H.; and Kastner, Ralph E., 4,492,650, Cl. 260-112.50R.
Kasuya, Katsuhiko; Mori, Hidetomo; Fujiwara, Mitsuru; and Matsunaga, Tetsuzo, to Hitachi, Ltd. Rotor tooth form for a screw rotor machine. 4,492,546, Cl. 418-201.000.
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Sato, Masato; Kataoka, Hiroyuki; and Arai, Yoshio, 4,492,985, Cl. 358-293.000.
Katayama, Kaneo, to Mitsubishi Denki Kabushiki Kaisha. One-body type air conditioner. 4,492,094, Cl. 62-262.000.
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Kaufmann, Erich, to D. W. Nicholson Corporation. Cable wheel mounting for cable cars. 4,492,416, Cl. 384-474.000.
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Kawada, Tetsuo; and Ozawa, Yoshio, to Copal Company Limited. Color correcting device for color printing light source. 4,492,457, Cl. 355-38.000.
Kawai, Yasuhiro, to Fuji Photo Film Co., Ltd. Image scanning system having a continuously rotating sub-scanning drum. 4,492,455, Cl. 355-3.00R.
Kawai, Yukio; Ogawa, Toshihisa; and Yoshida, Seietsu, to Toyota Jidosha Kabushiki Kaisha. Air-fuel ratio compensating apparatus for internal combustion engine. 4,492,199, Cl. 123-440.000.
Kawamo, Kazunori: *See*—
Chikaraishi, Takayo; Tuchiya, Yosimasa; and Kawamo, Kazunori, 4,492,405, Cl. 296-146.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Suzuki, Takeshi; Murao, Mikio; Uchida, Masahiro; Kumagai, Chikanori; and Yotsui, Yasuhiko, 4,492,570, Cl. 432-106.000.
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Matsumoto, Yuuichi; Kawasaki, Kiyomitsu; and Ishitani, Masato, 4,492,644, Cl. 252-522.00A.
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Asano, Yuichiro; Hirahashi, Akira; Ohga, Suehisa; Yabe, Tadashi; Kurita, Kunio; and Momose, Atsushi, 4,492,472, Cl. 356-376.000.
Kayaba Kogyo Kabushiki Kaisha: *See*—
Mochizuki, Norihiro; and Hashizume, Hiroyuki, 4,492,545, Cl. 418-149.000.
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Goldmann, Siegfried; Boshagen, Horst; Stoltefuss, Jurgen; Schramm, Matthias; Thomas, Gunter; and Kazda, Stanislav, 4,492,703, Cl. 424-266.000.
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Geller, Myer; Keenan, Thomas E.; Altman, Daniel E.; and Patterson, Richard H., 4,493,114, Cl. 455-617.000.
Keene, Douglas L.: *See*—
Lewis, George K.; Sun, Franklin K.; Keene, Douglas L.; and Fidel, Howard F., 4,492,120, Cl. 73-625.000.
Keisuke Honda: *See*—
Chubachi, Noriyoshi, 4,492,117, Cl. 73-597.000.

Keith, Alec D.; and Snipes, Wallace, to Key Pharmaceuticals, Inc. Protective skin matrix. 4,492,685, Cl. 424-28.000.
Keller, Michael R.: *See*—
Schwartz, Robert E.; and Keller, Michael R., 4,492,558, Cl. 431-4.000.
Keller, Peter: *See*—
Furst, Andor; Keller, Peter; and Muller, Marcel, 4,492,797, Cl. 549-265.000.
Kelley, Edwin L.: *See*—
Schick, Martin J.; and Kelley, Edwin L., 4,492,589, Cl. 44-51.000.
Schick, Martin J.; and Kelley, Edwin L., 4,492,590, Cl. 44-51.000.
Kemler, Marc: *See*—
Khimeche, Abdel-Cader; and Kemler, Marc, 4,493,076, Cl. 371-11.000.
Kendall Company, The: *See*—
Arkans, Edward J., 4,492,234, Cl. 128-677.000.
Kendall, Robert M.; Schreiber, Richard J.; and Kesselring, John P., to Alzeta Corporation. High efficiency, reduced emissions water heater. 4,492,185, Cl. 122-32.000.
Kendo Products Co., Inc.: *See*—
Wilson, Frank G.; and Patton, William A., 4,491,998, Cl. 15-119.00A.
Kenji, Kubota; Kouji, Fukunaga; Yasuzo, Kirita; and Hidemune, Naito, to Kuraray Co., Ltd. Apparatus for producing a controlled pulsed liquid flow. 4,492,531, Cl. 417-279.000.
Kennard, Lon H.; Hall, Duane O.; and Bangerter, Richard M., to Salt Lake Communications, Inc. Telephone alarm system. 4,492,820, Cl. 179-5.00P.
Kenney Manufacturing Company: *See*—
Comeau, Paul E., 4,492,262, Cl. 160-126.000.
Kerley, Eddie F. Device for relaxing and refreshing hands or feet. 4,492,221, Cl. 128-24.100.
Kernforschungszentrum Karlsruhe GmbH: *See*—
Burgkhart, Bertram; Hassib, Gabor; and Piesch, Ernst, 4,492,872, Cl. 250-484.100.
Kerrey, John S.: *See*—
Kobuck, Richard M.; Miller, Richard A.; Kalkbrenner, Ralph W.; Kerrey, John S.; and Duncan, Robert, 4,492,844, Cl. 219-121.0LC.
Kersten, Ralf T.; Tietgen, Karl H.; and Schlaak, Helmut F., to Siemens Aktiengesellschaft. Device for deflecting light through 180 degrees. 4,492,425, Cl. 350-96.140.
Kesselring, John P.: *See*—
Kendall, Robert M.; Schreiber, Richard J.; and Kesselring, John P., 4,492,185, Cl. 122-32.000.
Key Pharmaceuticals, Inc.: *See*—
Keith, Alec D.; and Snipes, Wallace, 4,492,685, Cl. 424-28.000.
Keystone Camera Corporation: *See*—
Zawodny, Arthur; and Krysicki, Jerzy, 4,492,446, Cl. 354-215.000.
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Kibayashi, Iwao: *See*—
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Kibby, Charles L.; and Kobylinski, Thaddeus P., to Gulf Research & Development Company. Method for converting synthesis gas using an activated cobalt-substituted layered aluminosilicate. 4,492,774, Cl. 518-713.000.
Kielhoffer, Karey. Archery bow with arrow rest therefor. 4,492,214, Cl. 124-24.00R.
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Randen, Ilkka U.; Kiema, Mikko; and Porthen, Lauri S., 4,492,399, Cl. 294-74.000.
Kilches, Helmut D.: *See*—
Lugscheider, Walter; Kilches, Helmut D.; Riegler, Ernst; and Zajicek, Ernst, 4,493,088, Cl. 373-22.000.
Kilstofte, Richard B.: *See*—
Martinez, Arthur T.; and Kilstofte, Richard B., 4,492,828, Cl. 200-5.00R.
Kim, Dongsung R.; and McClintock, John H., Jr., to Burroughs Corporation. Pipelined microprogrammed digital data processor employing microinstruction tasking. 4,493,019, Cl. 364-200.000.
Kim, Dongsung R.; and McClintock, John H., Jr., to Burroughs Corporation. Microprogrammed digital data processor employing microinstruction tasking and dynamic register allocation. 4,493,020, Cl. 364-200.000.
Kim, Syng N., to Wico Corporation. Joystick with single-leaf spring switch. 4,492,830, Cl. 200-6.00A.
Kimura, Kenji, to Olympus Optical Co., Ltd. Apparatus for effecting focus control for use in optical disc player. 4,492,856, Cl. 250-201.000.
Kimura, Takashi: *See*—
Osada, Noboru; Kanamori, Akira; Kimura, Takashi; Moroto, Seiro; Horie, Hideo; and Yoshizoe, Teruhide, 4,492,991, Cl. 360-70.000.
Kin, Lai: *See*—
Thaler, Arnold; Friedson, David; and Kin, Lai, 4,492,241, Cl. 132-37.00R.
Kinergy Corporation: *See*—
Dumbaugh, George D., 4,492,629, Cl. 209-332.000.
King, James L.: *See*—
Angelle, Phillip A.; Porter, Marion G.; and King, James L., 4,493,034, Cl. 364-200.000.
King, Paul F.: *See*—
Collmeyer, Arthur J.; Hoel, Jeffrey H.; King, Paul F.; Stanley, Donald O.; and Sturgeon, Roger, 4,492,956, Cl. 340-723.000.
Kinoshita, Mitsuo, to Fanuc Ltd. System for updating data in bubble memories. 4,493,083, Cl. 371-66.000.
Kircher, Dieter: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; and Weise, Lutz, 4,492,413, Cl. 303-92.000.
Kirin Beer Kabushiki Kaisha: *See*—
Miyazawa, Takashi, 4,492,476, Cl. 356-428.000.
Kirkland, James L. Rheological penetrometer. 4,492,111, Cl. 73-84.000.
Kishimoto, Yuuji: *See*—
Shimomura, Setsuhiro; and Kishimoto, Yuuji, 4,492,211, Cl. 123-585.000.
Kitagawa, Dennis T.: *See*—
Anderson, James M.; Knight, Thomas S., III; Kitagawa, Dennis T.; and Rey, Ernesto, 4,493,075, Cl. 371-10.000.
Kitamura, Susumu: *See*—
Imaya, Akihiko; and Kitamura, Susumu, 4,492,433, Cl. 350-339.00R.
Kitamura, Yutaka; Kitora, Yoshihisa; and Koyanagi, Masatoshi, to Mitsubishi Denki Kabushiki Kaisha. Alternating current generator for a car. 4,492,885, Cl. 310-62.000.
Kitora, Yoshihisa: *See*—
Kitamura, Yutaka; Kitora, Yoshihisa; and Koyanagi, Masatoshi, 4,492,885, Cl. 310-62.000.
Klemarczyk, Philip T.: *See*—
Sprecker, Mark A.; Klemarczyk, Philip T.; and Belko, Robert P., 4,492,645, Cl. 252-522.00R.
Klenk, Herbert, to Degussa Aktiengesellschaft. Process for the production of 2-amino-5-mercapto-1,3,4-thiadiazole. 4,492,793, Cl. 548-141.000.
Klingel, Hans: *See*—
Weck, Manfred; Klingel, Hans; and Werntze, Georg, 4,492,513, Cl. 414-729.000.
Kljuchko, Gennady V.; Padalka, Valentin G.; Sablev, Leonid P.; and Stupak, Rimma I. Plasma arc apparatus for applying coatings by means of a consumable cathode. 4,492,845, Cl. 219-121.00P.
Klompas, Nicholas, to General Electric Company. Segmented inlet nozzle for gas turbine, and methods of installation. 4,492,517, Cl. 415-139.000.
Knapp Pneumatics, Inc.: *See*—
Knapp, Wallace C., 4,492,147, Cl. 91-306.000.
Knapp, Wallace C., to Knapp Pneumatics, Inc. Reciprocatory air motor with cushioning pistons. 4,492,147, Cl. 91-306.000.
Knight, John H.; and Isaacson, Milton S., to Nu-Tech Industries, Inc. Optimum efficiency brushless DC motor. 4,492,903, Cl. 318-341.000.
Knight, Thomas S., III: *See*—
Anderson, James M.; Knight, Thomas S., III; Kitagawa, Dennis T.; and Rey, Ernesto, 4,493,075, Cl. 371-10.000.
Knoishiroku Photo Industry Co. Ltd.: *See*—
Haneda, Satoshi; Itaya, Masahiko; and Tanaka, Minoru, 4,492,456, Cl. 355-3.0DD.
Knoth, Werner-Dieter: *See*—
Nebelung, Hermann H.; and Knoth, Werner-Dieter, 4,492,595, Cl. 65-263.000.
Knowles, Robert C.; and Marshall, Darrell R., to Microdyne Corporation. Automatic gain control system. 4,492,930, Cl. 330-284.000.
Knox, Dick L., to Hughes Tool Company. Toroidal inductor for a pressure sensor in a submersible pump. 4,492,523, Cl. 417-13.000.
Knutsen, Daniel P., to Boise Cascade Corporation. Pocket ventilation roll baffle assembly. 4,492,044, Cl. 34-114.000.
Kobayashi, Akio: *See*—
Muramatsu, Toshihiko; Kobayashi, Akio; Kondo, Toshio; Isomura, Shigenori; and Eino, Tomomi, 4,492,202, Cl. 123-478.000.
Kobayashi, Hachisiro: *See*—
Mori, Yoshihisa; Kobayashi, Hachisiro; and Takashima, Mitsuru, 4,493,071, Cl. 369-146.000.
Kobayashi, Taishi: *See*—
Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; and Kobayashi, Taishi, 4,492,681, Cl. 423-345.000.
Kobuck, Richard M.; Miller, Richard A.; Kalkbrenner, Ralph W.; Kerrey, John S.; and Duncan, Robert, to Westinghouse Electric Corp. Welding plates for a fuel rod grid. 4,492,844, Cl. 219-121.0LC.
Kobylinski, Thaddeus P.: *See*—
Kibby, Charles L.; and Kobylinski, Thaddeus P., 4,492,774, Cl. 518-713.000.
Koch, Dieter; and Gianotti, Tonio, to Bruker-Analytische Messtechnik GmbH. Multiple piston pump with a constant discharge capacity. 4,492,524, Cl. 417-18.000.
Koch, Johannes: *See*—
Rupp, Werner; and Koch, Johannes, 4,492,154, Cl. 100-53.000.
Koenuma, Masao, to Asahi Seimitsu Kabushiki Kaisha. Vernier device of the digital display type for a universal parallel ruler. 4,492,031, Cl. 33-1.0PT.
Koga, Keigi: *See*—
Takano, Kazukiyo; and Koga, Keigi, 4,493,037, Cl. 364-405.000.
Kohlhaas, Folker: *See*—
Hoyer, Ernst; Kohlhaas, Folker; and Meininger, Fritz, 4,492,654, Cl. 534-827.000.
Kohno, Hideki: *See*—
Suzuki, Atsushi; Yamada, Hiromichi; Uchida, Yoko; Kohno, Hideki; and Yoshida, Minoru, 4,492,869, Cl. 250-367.000.
Kohshin Seimitsu Kikai Kabushiki Gaisha: *See*—
Hirose, Tomonao, 4,492,173, Cl. 112-240.000.
Koizumi, Noriaki: *See*—
Kato, Masaaki; Miyoshi, Teruzo; Kibayashi, Iwao; Ikemi, Masahisa; Gomi, Haruo; Ishimatsu, Yoshiaki; Koizumi, Noriaki; and Yamada, Hideaki, 4,492,757, Cl. 435-280.000.

Koizumi, Takayuki: *See*—
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Kokusai Denshin Denwa Co., Ltd.: *See*—
Izawa, Toshio; Iwamoto, Yoshinao; Shirasaki, Yuichi; and Asakawa, Kenichi, 4,492,492, Cl. 405-160.000.

Kokusan Kinzoku Kogyo Co., Ltd.: *See*—
Mochida, Haruo; Nakakooji, Hiroshi; and Namazue, Hirotoshi, 4,492,959, Cl. 340-825.560.

Koller, Wilhelm J.; and Vogel, Horst, to International Standard Electric Corporation. System for deriving precise instants of triggering of a pulsed device. 4,492,961, Cl. 343-7.300.

Komeyama, Yoshihiro: *See*—
Taniguchi, Motoya; Ikeda, Minoru; and Komeyama, Yoshihiro, 4,492,356, Cl. 248-346.000.

Kondo, Toshio: *See*—
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Kongs, David J.: *See*—
Landoll, Donald R.; Kongs, David J.; and Belknap, Alfred R., 4,492,507, Cl. 414-475.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Watanabe, Koji; Shiozawa, Kazuo; Suzuki, Kiziro; and Shimokawa, Ryushi, 4,492,450, Cl. 354-412.000.
Yamamoto, Takeshi; Suzuki, Norihito; Aoki, Toru; and Iwaki, Akio, 4,492,740, Cl. 428-629.000.

Kono, Takashi; Minegishi, Akira; and Kamai, Toshimitsu, to Sony Corporation. VTR With high-quality audio recording system. 4,492,986, Cl. 358-330.000.

Kontes Glass Company: *See*—
Apothaker, Richard L.; Reed, James; Croce, Carmen L.; and Wagner, Frederick B., III, 4,492,951, Cl. 338-316.000.

Koopman, Nicholas G.; and Marcotte, Vincent C., to International Business Machines Corporation. Process of brazing using low temperature braze alloy of gold-indium tin. 4,492,842, Cl. 219-85.00M.

Kopetzky, Horst, to Siemens Aktiengesellschaft. Subscriber connection circuit. 4,492,821, Cl. 179-18.0FA.

Korhola, Ossi: *See*—
Riihimaki, Eako; and Korhola, Ossi, 4,493,098, Cl. 378-146.000.

Korkhov, Oleg J.: *See*—
Sandulyak, Alexandr V.; Garaschenko, Vyacheslav I.; and Korkhov, Oleg J., 4,492,921, Cl. 324-204.000.

Koseki, Minoru: *See*—
Yoshida, Shigeru; Koseki, Minoru; and Horie, Masakatsu, 4,492,983, Cl. 358-260.000.

Koshii, Taro; and Yamashita, Mitsugu, to Toray Silicone Co., Ltd. Organopolysiloxane foam composition. 4,492,775, Cl. 521-77.000.

Kosova, Ghenz. Running shoe. 4,492,046, Cl. 36-27.000.

Kouji, Fukunaga: *See*—
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Koyama, Teruo: *See*—
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Koyanagi, Masatoshi: *See*—
Kitamura, Yutaka; Kitora, Yoshihisa; and Koyanagi, Masatoshi, 4,492,885, Cl. 310-62.000.

Kozakai, Asao; Watanabe, Shingo; and Nakanishi, Nobuyasu, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Regulator valve for hydraulic anti-skid apparatus. 4,492,414, Cl. 303-116.000.

Kozlowski, Robert M.: *See*—
Jennings, William B.; Kozlowski, Robert M.; and Hayes, Richmond S., Jr., 4,492,269, Cl. 165-172.000.

Kraft, Inc.: *See*—
Grabowski, Paul P., 4,492,153, Cl. 99-460.000.

Kralik, James G.; and Corcoran, William H., to California Institute of Technology. Method for removing sulfur from fossil fuels. 4,492,588, Cl. 44-1.00R.

Kramer, Charles F., to Steel Heddle Manufacturing Company. Extruded heddle rod and cap. 4,492,256, Cl. 139-92.000.

Kramer, Wolfgang; Jautelat, Manfred; and Kranz, Eckart, to Bayer Aktiengesellschaft. Alkylcycloalkyl imidazolylmethyl ketones as fungicide intermediates. 4,492,795, Cl. 548-341.000.

Kranz, Eckart: *See*—
Kramer, Wolfgang; Jautelat, Manfred; and Kranz, Eckart, 4,492,795, Cl. 548-341.000.

Kranzler, Ernst: *See*—
Baumann, Fritz; Kranzler, Ernst; Radke, Siegmund; Schilling, Rainer; Fuchs, Wolfgang; and Rieker, Werner, 4,492,344, Cl. 242-1.000.

Krautkraemer GmbH: *See*—
Bathmann, Hans-Jurgen; Hoh, Bernhard; and Schulz, Siegmar, 4,492,118, Cl. 73-612.000.

Krawiecki, Peter: *See*—
Appelblatt, Irving; and Krawiecki, Peter, 4,492,282, Cl. 180-68.100.

Kreft, Wilfried, to Krupp Polysius AG. Method and apparatus for heat treatment of fine-grained material. 4,492,566, Cl. 432-14.000.

Kreitzberg, Jeffrey P., to Nelson Irrigation Corporation. Flow control nozzle. 4,492,339, Cl. 239-230.000.

Kremer, Andre: *See*—
Burton, Clement; Kremer, Andre; Stomp, Hubert; and Solvi, Marc, 4,492,342, Cl. 241-67.000.

Kresse, Peter: *See*—
Brunn, Horst; Hund, Franz; Rambold, Wolfgang; Kresse, Peter; and von Szadkowski, Gerd, 4,492,600, Cl. 106-14.340.

Kroupa, Petr: *See*—
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Krupp Polysius AG: *See*—
Kreft, Wilfried, 4,492,566, Cl. 432-14.000.

Krysicki, Jerzy: *See*—
Zawodny, Arthur; and Krysicki, Jerzy, 4,492,446, Cl. 354-215.000.

Kubota, Toru; Tamate, Masazi; and Sauzu, Masaaki, to Nissan Motor Company, Limited. Battery voltage drop alarm device for a battery forklift truck. 4,492,955, Cl. 340-636.000.

Kuck, Ulrich: *See*—
Esser, Karl; Stahl, Ulf; Tudzynski, Paul; and Kuck, Ulrich, 4,492,758, Cl. 435-317.000.

Kuenzi, Martin: *See*—
Ghisalba, Oreste; Heinzer, Franz; and Kuenzi, Martin, 4,492,756, Cl. 435-253.000.

Kufrin, Fred W.: *See*—
Nettesheim, Daniel R.; and Kufrin, Fred W., 4,492,162, Cl. 101-103.000.

Kuhn, Gerhard; and Jacobs, John J., to Carrier Corporation. Motor-compressor unit. 4,492,127, Cl. 74-50.000.

Kukes, Simon G., to Phillips Petroleum Company. Hydrofining process for hydrocarbon containing feed streams. 4,492,626, Cl. 208-251.00H.

Kukolja, Stjepan: *See*—
Blaszczak, Larry C.; Kukolja, Stjepan; and Turner, Jan R., 4,492,693, Cl. 424-246.000.

Kulik, Alphonse C., to USM Corporation. Insole support plate mechanism. 4,491,996, Cl. 12-10.100.

Kumagai, Chikanori: *See*—
Suzuki, Takeshi; Murao, Mikio; Uchida, Masahiro; Kumagai, Chikanori; and Yotsui, Yasuhiko, 4,492,570, Cl. 432-106.000.

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Denton, Robert K., Jr.; and Kumar, Narayan G., 4,492,777, Cl. 523-115.000.

Kume, Kazunari: *See*—
Hatsuse, Toshikazu; and Kume, Kazunari, 4,492,479, Cl. 368-109.000.

Kumoi, Sadakatsu; Mitarai, Keiji; and Tsutsumi, Yukihiro, to Toyo Soda Manufacturing Co., Ltd. Method for producing bis[β-(N,N-dimethylamino)alkyl]-ether. 4,492,803, Cl. 564-486.000.

Kung, Hsiang-Tsung; and Leiserson, Charles E., to Carnegie-Mellon University. Systolic array apparatuses for matrix computations. 4,493,048, Cl. 364-754.000.

Kuniyoshi, Takashi: *See*—
Takimoto, Hiroyuki; Kuniyoshi, Takashi; and Ushiro, Tatsuzo, 4,492,982, Cl. 358-228.000.

Kunst, Helmut: *See*—
Muller, Johannes; Kunst, Helmut; and Scondo, Christian, 4,492,604, Cl. 148-15.500.

Kuo, Samuel C., to GTE Products Corporation. Groundplane mounted log-periodic antenna. 4,492,964, Cl. 343-792.500.

Kuraray Co., Ltd.: *See*—
Kenji, Kubota; Kouji, Fukunaga; Yasuzo, Kirita; and Hidemune, Naito, 4,492,531, Cl. 417-279.000.
Tanaka, Taku; Maruyama, Hitoshi; Okaya, Takuji; and Kajitani, Koichi, 4,492,783, Cl. 524-430.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
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Okada, Shingo, 4,492,137, Cl. 83-175.000.

Kurihara, Michio: *See*—
Hiratsuka, Kosai; Nakamura, Yoichi; Maruko, Morihisa; Matsuura, Yoshio; and Kurihara, Michio, 4,492,638, Cl. 210-728.000.

Kurita, Kunio: *See*—
Asano, Yuichiro; Hirahashi, Akira; Ohga, Suehisa; Yabe, Tadashi; Kurita, Kunio; and Momose, Atsushi, 4,492,472, Cl. 356-376.000.

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Ito, Yasuro; Higuchi, Yoshiro; Tsuji, Masanori; Yamamoto, Yasuhiro; Tada, Hiroshi; Kuroha, Kenji; Nakamura, Takashi; and Tomikawa, Koichi, 4,492,478, Cl. 366-28.000.

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Kwon, Oh K.: *See*—
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Landa, Benzion, to Savin Corporation. Resilient-feed ball injector for microballistic printer. 4,492,300, Cl. 198-443.000.
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Lee, Francis C.; Mills, Ross N.; Niweigha, Tiefa K.; and Talke, Frank E., to International Business Machines. Dynamic control of nonlinear ink properties for drop-on-demand ink jet operation. 4,492,968, Cl. 346-140.00R.
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Levitt, George; and Petersen, Wallace C., to Du Pont de Nemours, E. I., and Company. Herbicidal s-triazines. 4,492,599, Cl. 71-93.000.
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Lewis, George K.; Sun, Franklin K.; Keene, Douglas L.; and Fidel, Howard F., to Irex Corporation. Dual function ultrasonic transducer assembly. 4,492,120, Cl. 73-625.000.
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Luke, Roger D.; Ingram, Wayne A.; and Jarrell, Michael S., to Siemens-Allis, Inc. One-piece, slam-type latch for snap-in installation. 4,492,396, Cl. 292-228.000.
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Luz, David W.; and Willis, Donald H., to RCA Corporation. Single controllable switch, push-pull inverter for a television receiver ferro-resonant power supply. 4,492,900, Cl. 315-411.000.
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Mabille, Pierre, to Electro Medical Systems, S.A. Dental prophylactic apparatus. 4,492,575, Cl. 433-88.000.
MacCarthy, Patrick. Yo-yo with non-circular cross-sectional axle. 4,492,057, Cl. 446-250.000.
MacDonald, Daniel J., to Litton Industrial Products, Inc. Stator winding providing magnetomotive force wave of reduced harmonic content. 4,492,890, Cl. 310-184.000.
MacGregor, Douglas B.; Moyer, William C.; Mills, Marvin A., Jr.; and Zolnowsky, John E., to Motorola, Inc. Data processor version validation. 4,493,035, Cl. 364-200.000.
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Malesko, Michael W., to Gulf & Western Manufacturing Company. Door jamb switch. 4,492,833, Cl. 200-61.780.
Mallen-Herrero, Jose; Leroy, Daniel; Zimmermann, Urs; and Charlat, Patrice, to Compagnie de Construction Mecanique Sulzer. Rotary electrohydraulic device with axially sliding vanes. 4,492,541, Cl. 418-23.000.
Mallett, A. J., to Halliburton Company. Resonant frequency modification of piezoelectric transducers. 4,493,062, Cl. 367-32.000.
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Mansour, Maher L., to Ashland Oil, Inc. Curing chamber with constant gas flow environment and method. 4,492,041, Cl. 34-15.000.
Mao, Robert S., to International Business Machines Corporation. RAM Utilizing offset contact regions for increased storage capacitance. 4,493,056, Cl. 365-149.000.
Marchand, William C. Multi-stage vane stator for radial inflow turbine. 4,492,520, Cl. 415-150.000.
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Marcus, Konrad H.; and Fleming, Dennis J., to Prince Corporation. Visor actuating mechanism. 4,492,404, Cl. 296-97.00J.
Marcuse, Dietrich; and Presby, Herman M., to AT&T Bell Laboratories. Method for inspecting multilayer transparent rods. 4,492,463, Cl. 356-73.100.
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Martin, Gregory W., to Carrier Corporation. Tube pulling apparatus. 4,492,327, Cl. 226-177.000.
Martin, H. Woods, to AE PLC. Centrifugal separator. 4,492,631, Cl. 210-127.000.
Martin, Lawrence G.: *See*—
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Martin, Marshal H., to Indicator Controls Corporation. Solid state regulated power supply system for cold cathode luminous tube. 4,492,899, Cl. 315-308.000.
Martin, Richard T., to Applied Magnetics Corporation. Apparatus for indexing and registering a selected deposition mask to a substrate and method therefor. 4,492,180, Cl. 118-704.000.
Martinez, Arthur T.; and Kilstofte, Richard B., to T.A.D. Avanti, Inc. Slide selector switch. 4,492,828, Cl. 200-5.00R.
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Yapp, Robert E.; and Smith, John D., 4,492,080, Cl. 60-388.000.
Massinger, Barry K.: *See*—
Smets, John E.; Smets, John S.; Smets, Robert D.; and Massinger, Barry K., 4,492,016, Cl. 29-432.000.
Masstron Scale Inc.: *See*—
Susor, William C., deceased, 4,492,280, Cl. 177-211.000.
Masuda, Akira: *See*—
Miyaki, Masahiko; Masuda, Akira; and Matsumura, Toshimi, 4,492,534, Cl. 417-386.000.
Masuda, Yoshikazu: *See*—
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Masuhara, Toshiaki: *See*—
Yoshida, Isao; Okabe, Takeaki; Katsueda, Mineo; Nagata, Minoru; Masuhara, Toshiaki; Ashikawa, Kazutoshi; Kato, Hideaki; Ito, Mitsuo; Ohtaka, Shigeo; Minato, Osamu; and Sakai, Yoshio, 4,492,974, Cl. 357-23.000.
Masumoto, Hisayuki; and Shimomura, Masaichi, to Minolta Camera Kabushiki Kaisha. Zoom lens system. 4,492,437, Cl. 350-428.000.
Matarainen, Reino, to Valmet OY. Apparatus for on-machine supercalendering of paper. 4,492,612, Cl. 162-360.00R.
Mathematical Sciences Northwest, Inc.: *See*—
Grynberg, Jack; Nelson, Leonard Y.; and Moody, Stephen E., 4,492,862, Cl. 250-255.000.
Matsubara, Tooru, to Nissan Shatai Company, Limited. Retractable air deflector. 4,492,406, Cl. 296-217.000.
Matsui, Kazuma: *See*—
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,492,515, Cl. 415-53.00T.
Matsuki, Seiichiro: *See*—
Kamimura, Testuro; and Matsuki, Seiichiro, 4,492,998, Cl. 360-132.000.
Matsumoto, Yuuichi; Kawasaki, Kiyomitsu; and Ishitani, Masato, to Soda Aromatic Company, Limited. Slowly releasing perfume compositions. 4,492,644, Cl. 252-522.00A.
Matsumura, Toshimi: *See*—
Miyaki, Masahiko; Masuda, Akira; and Matsumura, Toshimi, 4,492,534, Cl. 417-386.000.
Matsunaga, Tetsuzo: *See*—
Kasuya, Katsuhiko; Mori, Hidetomo; Fujiwara, Mitsuru; and Matsunaga, Tetsuzo, 4,492,546, Cl. 418-201.000.
Matsuo, Seitaro; and Ono, Toshiro, to Nippon Telegraph & Telephone Public Corporation. Plasma deposition method and apparatus. 4,492,620, Cl. 204-192.00R.
Matsushita Electric Industrial Co., Ltd.: *See*—
Arai, Kazuo; and Shimamoto, Takeshi, 4,492,581, Cl. 434-128.000.
Hashimoto, Kiyokazu; and Hayashi, Keizi, 4,492,988, Cl. 358-336.000.
Hayakawa, Daishiro; Akimoto, Masao; Narita, Katsumi; and Tani, Kenroku, 4,492,928, Cl. 330-126.000.
Ishihara, Shin-ichiro; Hirao, Takashi; Mori, Koshiro; and Mochizuki, Motonori, 4,492,605, Cl. 148-174.000.
Ishihara, Shoichi; Yoneno, Hiroshi; and Yamamoto, Ryoichi, 4,492,725, Cl. 428-69.000.
Minami, Eiji, 4,492,958, Cl. 340-825.250.
Takata, Manabu; Inoue, Shojiro; and Mori, Keiichi, 4,492,336, Cl. 236-20.00A.
Matsuura, Yoshio: *See*—
Hiratsuka, Kosai; Nakamura, Yoichi; Maruko, Morihisa; Matsuura, Yoshio; and Kurihara, Michio, 4,492,638, Cl. 210-728.000.
Mattei, Eliane. Air pressurizers/conditioners especially for work cabs in a polluted atmosphere. 4,492,151, Cl. 98-2.110.
Mattel, Inc.: *See*—
Chang, Richard S.; Ling, John Y.; and Shoff, Daniel J., 4,492,582, Cl. 434-169.000.
Matthews, J. Lester: *See*—
Farris, Edward T.; and Matthews, J. Lester, 4,492,577, Cl. 433-201.000.
Mattson, Fred P. Adaptor for external oil filter. 4,492,632, Cl. 210-168.000.
Matveen, Viktor I.: *See*—
Strekalou, Genrikhn; Shtyrin, Anatoly S.; Matveen, Viktor I.; Maryanchik, Mikhail A.; and Garibov, Genrikh S., 4,492,848, Cl. 219-127.000.
Maucher, Paul, to Luk Lamellen und Kupplungsbau GmbH. Diaphragm spring for use in friction clutches or the like. 4,492,293, Cl. 192-89.00B.
Mauduit, Daniel: *See*—
Boshra-Riad, Mokhtar; Fedeli, Jean-Marc; Jouve, Hubert; and Mauduit, Daniel, 4,493,054, Cl. 365-36.000.
Maul, Rudolf; Otto, Eberhard; and Zinke, Horst, to Ciba-Geigy Corporation. Process for producing triarylphosphites. 4,492,661, Cl. 260-976.000.
Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, to Bayer Aktiengesellschaft. Process for the preparation of 1,1-dichloroalkenes. 4,492,800, Cl. 562-506.000.
Mayer, Thomas; Temple, Michael D.; Boling, Norman L.; and Rancourt, James D., to Burroughs Corporation. Rotation coating of disk substrate with acrylate prepolymer. 4,492,718, Cl. 427-160.000.
Mayes, Daniel J., to Great Neck Saw Manufacturing, Inc. Top-view-reading level. 4,492,038, Cl. 33-379.000.
McAllister, George P.: *See*—
Robinson, Thomas D.; Sharp, Lewis A., Jr.; and McAllister, George P., 4,491,990, Cl. 4-607.000.
McCabe, Barkman C.; and Zajac, Edward, to Magma Power Company. Geothermal salinity control system. 4,492,083, Cl. 60-641.500.
McCann, John J.: *See*—
Burkhardt, James L.; and McCann, John J., 4,492,987, Cl. 358-332.000.
McClintock, John H., Jr.: *See*—
Kim, Dongsung R.; and McClintock, John H., Jr., 4,493,019, Cl. 364-200.000.
Kim, Dongsung R.; and McClintock, John H., Jr., 4,493,020, Cl. 364-200.000.
McCoy, James J., Jr., to Tenneco, Inc. Method and apparatus for controlling recirculation in a centrifugal pump. 4,492,516, Cl. 415-53.00T.
McCurdy, Robert: *See*—
Williams, Daniel W., 4,492,378, Cl. 273-142.0HA.
McElreath, Kenneth W.: *See*—
Fabian, Gordon R.; and McElreath, Kenneth W., 4,492,907, Cl. 318-586.000.
McElroy, David J., to Texas Instruments Incorporated. Method of making high density semiconductor device such as floating gate electrically programmable ROM or the like. 4,493,057, Cl. 365-182.000.
McEntire, Edward E.; Sellstrom, Kathy B.; Nieh, Edward C. Y.; and Livingston, David R., to Texaco Inc. Production of N-substituted (meth)acrylamides from (meth)acrylates and amines over a metal alkoxide catalyst. 4,492,801, Cl. 564-135.000.
McFee, James H.: *See*—
Finegan, Sean N.; McFee, James H.; and Swartz, Robert G., 4,492,852, Cl. 219-405.000.
McGrail, John F. Closure device for toilet seats. 4,491,989, Cl. 4-251.000.
McGraw-Edison Company: *See*—
Lent, Mark S., 4,492,208, Cl. 123-527.000.
Prescott, Robert C.; Gold, Calman; and Anderson, Eric V., 4,492,246, Cl. 137-85.000.
McLeod, Alasdair D., to B.M.H. Feedgear. Article turning device. 4,492,299, Cl. 198-417.000.
Meadowcraft Inc.: *See*—
Weaver, Henry; and Pawlush, Joseph C., 4,492,104, Cl. 72-56.000.
Meeker, David M.; and Lillibridge, Harold R., to Champion International Corporation. Quick opening envelope. 4,492,308, Cl. 206-610.000.
Mega International, Inc.: *See*—
Hopmayer, Gary S.; and Barone, Charles, 4,493,018, Cl. 363-145.000.
Meier, Richard: *See*—
Chmela, Franz; Herzog, Walter; and Meier, Richard, 4,492,194, Cl. 123-276.000.

Meinander, Paul O., to Osakeyhtio, A. Ahlstrom. Extended nip press with movable sealing strips. 4,492,611, Cl. 162-358.000.
Meinard, Colette: *See*—
Herve, Jean-Jacques; Suglia, Jean-Claude; and Meinard, Colette, 4,492,687, Cl. 424-174.000.
Meininger, Fritz: *See*—
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Memorial Hospital for Cancer and Allied Diseases: *See*—
Fleisher, Martin; and Winawer, Sidney J., 4,492,124, Cl. 73-864.440.
Mendiratta, Ashok K.; and Morgan, Wayne F., to General Electric Company. Process for preparing alkali metal salts of hydroxyaromatic compounds. 4,492,806, Cl. 568-723.000.
Menini, Joseph: *See*—
Sick, Peter; and Menini, Joseph, 4,492,259, Cl. 141-198.000.
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Mercer, Melvin R.: *See*—
Agrawal, Vishwani D.; and Mercer, Melvin R., 4,493,077, Cl. 371-25.000.
Merck & Co., Inc.: *See*—
Friedman, Arthur J., 4,492,700, Cl. 424-250.000.
Merk, Wolfgang: *See*—
Werle, Peter; Focke, Holger; Popp, Klaus; and Merk, Wolfgang, 4,492,643, Cl. 252-311.000.
Merkel, Wulf; Bormann, Dieter; and Muschaweck, Roman, to Hoechst Aktiengesellschaft. Substituted pyrrolidinyl-benzoic acid derivatives and a process for their manufacture. 4,492,710, Cl. 424-274.000.
Merten, Josef: *See*—
Claussen, Uwe; Merten, Josef; Rohr, Harry; and Melchior, Bernd, 4,492,778, Cl. 523-137.000.
Messner, Daniel R.: *See*—
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Metal Box Public Limited Company: *See*—
Ginn, Ian D.; Gleave, Leonard; and Woods, Leslie, 4,492,135, Cl. 83-155.000.
Meyer Manufacturing Company, Limited: *See*—
Lam, Yanta, 4,492,853, Cl. 219-432.000.
Meyer, Werner: *See*—
Rohner, Peter; Schippl, Klausdieter; Blumenberg, Gunther; Meyer, Werner; and Obert, Wolfgang, 4,492,089, Cl. 62-55.000.
Michaud, Horst; and von Seyerl, Joachim, to SKW Trostberg Aktiengesellschaft. Cyanuric chloride having improved shelf life. 4,492,679, Cl. 423-268.000.
Michel, Frederick A., to Standard Oil Company (Indiana). Premix-type burner distributer tip. 4,492,562, Cl. 431-177.000.
Michel, Karl H.; and Kastner, Ralph E., to Eli Lilly and Company. A54556 Antibiotics and process for production thereof. 4,492,650, Cl. 260-112.50R.
Mickelson, Nils P.; and De LaChapelle, Richard P., to GTE Products Corporation. Surge arrester assembly. 4,493,003, Cl. 361-119.000.
Microdyne Corporation: *See*—
Knowles, Robert C.; and Marshall, Darrell R., 4,492,930, Cl. 330-284.000.
Midland-Ross Corporation: *See*—
Vanderhelst, Peter W., 4,493,040, Cl. 364-477.000.
Midou, Nobuo: *See*—
Asano, Etso; Suzuki, Yasuro; and Midou, Nobuo, 4,492,884, Cl. 310-45.000.
Miki, Yukio; and Egawa, Takeshi, to Minolta Camera Kabushiki Kaisha. Mounting device of optical unit. 4,492,429, Cl. 350-257.000.
Mildenberger, Hilmar: *See*—
Willms, Lothar; Huttelmaier, Thomas; Mildenberger, Hilmar; Bauer, Klaus; Burstell, Helmut; and Bieringer, Hermann, 4,492,598, Cl. 71-93.000.
Miles Laboratories, Inc.: *See*—
Bogusiaski, Robert C.; Carrico, Robert J.; and Christner, James E., 4,492,751, Cl. 435-7.000.
Miles, Peter R.: *See*—
Farhangi, Hassan; Miles, Peter R.; and Daskalakis, Costas N., 4,493,106, Cl. 382-41.000.
Milkovic, Miran, to General Electric Company. Current sensors. 4,492,919, Cl. 324-127.000.
Miller, Albert J., to Atlas Electronics International. Automotive driving condition alarm system. 4,492,952, Cl. 340-52.00F.
Miller, Bertram W. Method and apparatus for ascertaining color balance of photographic printing paper. 4,492,474, Cl. 356-404.000.
Miller, James H.: *See*—
Diaz, Zaida; and Miller, James H., 4,492,592, Cl. 62-18.000.
Miller, Michael B.: *See*—
Lewis, Norris E.; and Miller, Michael B., 4,492,427, Cl. 350-96.200.
Miller, Richard A.; and Lessman, Gerald G., to Westinghouse Electric Corp. Apparatus and method for laser machining in a non-reactive environment. 4,492,843, Cl. 219-121.0LC.
Miller, Richard A.: *See*—
Kobuck, Richard M.; Miller, Richard A.; Kalkbrenner, Ralph W.; Kerrey, John S.; and Duncan, Robert, 4,492,844, Cl. 219-121.0LC.
Miller, Richard L.: *See*—
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Mills, Marvin A., Jr.: *See*—
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Mimura, Yoshiyuki; Okada, Takao; and Toda, Akitoshi, to Olympus Optical Co., Ltd. Photosensitive member for electrophotography with mirror finished support. 4,492,745, Cl. 430-67.000.
Minami, Eiji, to Matsushita Electric Industrial Co., Ltd. Device for controlling and displaying the functions of an electric or electronic apparatus. 4,492,958, Cl. 340-825.250.
Minato, Osamu: *See*—
Yoshida, Isao; Okabe, Takeaki; Katsueda, Mineo; Nagata, Minoru; Masuhara, Toshiaki; Ashikawa, Kazutoshi; Kato, Hideaki; Ito, Mitsuo; Ohtaka, Shigeo; Minato, Osamu; and Sakai, Yoshio, 4,492,974, Cl. 357-23.000.
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Ministry of International Trade & Industry: *See*—
Tajima, Michio, 4,492,871, Cl. 250-459.100.
Mink, George. Amplified motion transmitting device. 4,492,512, Cl. 414-744.00A.
Minnesota Mining & Manufacturing Company: *See*—
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Minolta Camera Kabushiki Kaisha: *See*—
Ishikawa, Norio; and Omaki, Takanobu, 4,492,448, Cl. 354-406.000.
Masumoto, Hisayuki; and Shimomura, Masaichi, 4,492,437, Cl. 350-428.000.
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Mita Industrial Co. Ltd.: *See*—
Miyakawa, Nobuhiro; Higashiguti, Teruaki; Sano, Yumiko; and Funato, Masatomi, 4,492,746, Cl. 430-71.000.
Mitarai, Keiji: *See*—
Kumoi, Sadakatsu; Mitarai, Keiji; and Tsutsumi, Yukihiro, 4,492,803, Cl. 564-486.000.
Mitsuaki, Seki; Tazaki, Shigemitsu; and Shirato, Yoshiaki, to Canon Kabushiki Kaisha. Recording apparatus. 4,492,966, Cl. 346-33.00A.
Mitsubishi Chemical Industries Limited: *See*—
Hasegawa, Takashi; Tsuchihashi, Koji; and Yamashita, Hiroshi, 4,492,771, Cl. 502-420.000.
Takashima, Ryokichi; Goko, Nobuaki; Uehara, Yumito; Nishihara, Yasuhiro; and Yamamoto, Hidetoshi, 4,492,787, Cl. 525-53.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
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Higashino, Shigenori, 4,493,014, Cl. 363-14.000.
Katayama, Kaneo, 4,492,094, Cl. 62-262.000.
Kitamura, Yutaka; Kitora, Yoshihisa; and Koyanagi, Masatoshi, 4,492,885, Cl. 310-62.000.
Ohnishi, Masaru; and Saito, Masayuki, 4,492,965, Cl. 346-1.100.
Shima, Ichiji; Teshima, Hiroshi; Koizumi, Takayuki; and Usami, Teruo, 4,493,042, Cl. 364-507.000.
Shimomura, Setsuhiro; and Kishimoto, Yuuji, 4,492,211, Cl. 123-585.000.
Toba, Yasuo, 4,492,944, Cl. 336-69.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Yamashita, Riichiro; and Satonishi, Osamu, 4,493,103, Cl. 382-1.000.
Mitsui Kinzoku Kogyo K.K.: *See*—
Yamada, Shinjiro, 4,492,395, Cl. 292-216.000.
Mitutoyo Mfg. Co., Ltd.: *See*—
Ichikawa, Souji, 4,492,033, Cl. 33-125.00C.
Nishina, Shingo; Takahashi, Seigo; and Ohtani, Shigeru, 4,492,034, Cl. 33-170.000.
Miura, Hideo, to Toyo Seikan Kaisha, Ltd. Baking and drying furnace for containers such as cans. 4,492,571, Cl. 432-225.000.
Miura, Kazuhiko: *See*—
Ozaki, Tadashi; Hattori, Tadashi; Miura, Kazuhiko; Hanaoka, Masanori; and Hashiguchi, Yukihide, 4,492,109, Cl. 73-35.000.
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Miyakawa, Nobuhiro; Higashiguti, Teruaki; Sano, Yumiko; and Funato, Masatomi, to Mita Industrial Co. Ltd. Electrophotographic photosensitive material with polyester binder. 4,492,746, Cl. 430-71.000.
Miyake, Masaya: *See*—
Hara, Akio; Miyake, Masaya; and Yazu, Shuji, 4,492,846, Cl. 219-121.0LC.
Miyaki, Masahiko; Masuda, Akira; and Matsumura, Toshimi, to Nippondenso Co., Ltd. Fuel injection pump for internal combustion engine. 4,492,534, Cl. 417-386.000.
Miyamoto, Koichi: *See*—
Kan, Yasuhito; and Miyamoto, Koichi, 4,492,371, Cl. 271-21.000.
Miyano, Toshiyuki; and Ohmura, Hideo, to Tokyo Shibaura Denki Kabushiki Kaisha. Bundling apparatus. 4,492,072, Cl. 53-586.000.
Miyata, Hiroyasu; Yamaguchi, Akio; and Watanabe, Keizo, to Sanshin Electric Co., Ltd. Push-button tuner. 4,492,125, Cl. 74-10.330.
Miyazawa, Takashi, to Kirin Beer Kabushiki Kaisha. Defect detecting method and apparatus. 4,492,476, Cl. 356-428.000.
Miyoshi, Teruzo: *See*—
Kato, Masaaki; Miyoshi, Teruzo; Kibayashi, Iwao; Ikemi, Masahisa; Gomi, Haruo; Ishimatsu, Yoshiaki; Koizumi, Noriaki; and Yamada, Hideaki, 4,492,757, Cl. 435-280.000.

Mizokami, Kazunori, to Olympus Optical Co., Ltd. Photometric circuit having a plurality of photoelectric transducer elements capable of being selectively enabled for photometry. 4,492,858, Cl. 250-214.00P.
Mizrah, Tiberiu; Hoffmann, Matthias; Kaser, Peter; and Heilig, Klemens, to Swiss Aluminium Ltd. Process for manufacturing solid cathodes. 4,492,670, Cl. 419-9.000.
Mizuno, William G., to Economics Laboratory, Inc. In-tank toilet bowl cleaner dispenser. 4,491,988, Cl. 4-228.000.
Mizutani, Takayuki: *See*—
Yasuda, Haruo; Yoshida, Kunihiko; Iwai, Yasuro; and Mizutani, Takayuki, 4,492,850, Cl. 219-145.210.
Mizutani, Yasukazu: *See*—
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Mobil Oil Corporation: *See*—
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Horodysky, Andrew G., 4,492,642, Cl. 252-49.600.
Mochida, Haruo; Nakakooji, Hiroshi; and Namazue, Hirotoshi, to Nissan Motor Company, Limited and Kokusan Kinzoku Kogyo Co., Ltd. Keyless entry system for an automotive vehicle. 4,492,959, Cl. 340-825.560.
Mochizuki, Motonori: *See*—
Ishihara, Shin-ichiro; Hirao, Takashi; Mori, Koshiro; and Mochizuki, Motonori, 4,492,605, Cl. 148-174.000.
Mochizuki, Norihiro; and Hashizume, Hiroyuki, to Kayaba Kogyo Kabushiki Kaisha. Cam ring for vane pump. 4,492,545, Cl. 418-149.000.
Modrak, James P.: *See*—
Duszak, Francis J.; Modrak, James P.; and Deaver, Dick, 4,492,781, Cl. 524-59.000.
Moeller, Matthias: *See*—
Kausche, Helmold; Moeller, Matthias; and Fischer, Franz, 4,492,813, Cl. 136-256.000.
Molex Incorporated: *See*—
Schneider, Thomas E.; and Funcik, Jack F., 4,492,023, Cl. 29-861.000.
Molitor, Robert L. Static phase converter. 4,492,911, Cl. 318-779.000.
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Brashears, David F.; and Mollick, Joseph T., 4,492,171, Cl. 110-261.000.
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Moore Business Forms, Inc.: *See*—
Lukis, Lawrence J.; and Duhig, Gerard P., 4,493,104, Cl. 382-13.000.
Morel, Andre ; and Morel, Jacques, to Etablissements Morel, Ateliers Electromecaniques de Favieres. Splice-protecting sleeve for electric cables or telephone cables. 4,492,816, Cl. 174-92.000.
Morel, Jacques: *See*—
Morel, Andre ; and Morel, Jacques, 4,492,816, Cl. 174-92.000.
Morgan, Wayne F.: *See*—
Mendiratta, Ashok K.; and Morgan, Wayne F., 4,492,806, Cl. 568-723.000.
Mori, Hidetomo: *See*—
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Mori, Keiichi: *See*—
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Mori, Koshiro: *See*—
Ishihara, Shin-ichiro; Hirao, Takashi; Mori, Koshiro; and Mochizuki, Motonori, 4,492,605, Cl. 148-174.000.
Mori, Yoshihisa; Kobayashi, Hachisiro; and Takashima, Mitsuru, to Sony Corporation. Pickup cartridge. 4,493,071, Cl. 369-146.000.
Morimoto, Masafumi: *See*—
Hashimoto, Shintaro; Morimoto, Masafumi; Nakanishi, Tosaku; Yoshida, Hideo; and Yanagiuchi, Shigenobu, 4,493,050, Cl. 364-900.000.
Moriya, Michio, to Sumitomo Electric Industries, Ltd. Brake pressure control valve with a disabler for split braking system. 4,492,411, Cl. 303-6.00C.
Moriyama, Masakazu; and Saito, Takao, to Toyota Jidosha Kogyo Kabushikik Kaisha. Apparatus for controlling air conditioner by voice. 4,493,100, Cl. 381-43.000.
Moriyasu, Toshinori: *See*—
Suzuki, Shinichi; Sasaki, Masayuki; Moriyasu, Toshinori; and Arakawa, Takao, 4,492,452, Cl. 354-430.000.
Moroto, Seiro: *See*—
Osada, Noboru; Kanamori, Akira; Kimura, Takashi; Moroto, Seiro; Horie, Hideo; and Yoshizoe, Teruhide, 4,492,991, Cl. 360-70.000.
Morrill, Giles W., to Morrill Motors of Virginia, Inc. Flexible conduit connection for motor. 4,492,357, Cl. 248-674.000.
Morrill Motors of Virginia, Inc.: *See*—
Morrill, Giles W., 4,492,357, Cl. 248-674.000.
Morris, Earl L.; Hafner, V. Walter; and Hahn, Ron T., to Acorn Engineering Company. Security mirror replaceable from pipe chase. 4,492,430, Cl. 350-631.000.
Morris, Horton H.: *See*—
Young, Raymond H.; Morris, Horton H.; and Brooks, Robert L., 4,492,628, Cl. 209-5.000.
Morrison, Norman J., to Flexibox Limited. Membrane type couplings. 4,492,583, Cl. 464-99.000.
Morrison, Robert A.; and Frink, Attila, to Lockheed Corporation. Electronic packaging module utilizing phase-change conductive cooling. 4,493,010, Cl. 361-385.000.
Morsch, Joachim: *See*—
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Morse, Hugh B.; and Masch, Helmut E. Case loading apparatus and method. 4,492,070, Cl. 53-438.000.
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Jensen, Uffe L.; and Mortensen, Sten, 4,492,040, Cl. 34-10.000.
Moschensky, Anatoly D.: *See*—
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Mosier, Benjamin. Method of preparing microspheres for intravascular delivery. 4,492,720, Cl. 427-213.300.
Moss, Elvis W., to Brunswick Corporation. Anti-reverse mechanism. 4,492,347, Cl. 242-84.20R.
Mostek Corporation: *See*—
Holberg, Douglas R., 4,492,927, Cl. 330-9.000.
Motorola, Inc.: *See*—
Deweck, Lionel, 4,492,931, Cl. 330-294.000.
Grieco, Steven E., 4,492,933, Cl. 331-66.000.
MacGregor, Douglas B.; Moyer, William C.; Mills, Marvin A., Jr.; and Zolnowsky, John E., 4,493,035, Cl. 364-200.000.
Vyne, Robert L., 4,492,929, Cl. 330-253.000.
Moyer, William C.: *See*—
MacGregor, Douglas B.; Moyer, William C.; Mills, Marvin A., Jr.; and Zolnowsky, John E., 4,493,035, Cl. 364-200.000.
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Rossmann, Axel; and Huether, Werner, 4,492,522, Cl. 416-241.00R.
Mueller, Erwin, to Siemens Aktiengesellschaft. Electro-magnetic relay. 4,492,942, Cl. 335-202.000.
Muhlbock, Franz: *See*—
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Muller, Kurt: *See*—
Dreyfuss, Wilfried; Remp, Thomas E., Jr.; and Muller, Kurt, 4,492,666, Cl. 264-261.000.
Muller, Marcel: *See*—
Furst, Andor; Keller, Peter; and Muller, Marcel, 4,492,797, Cl. 549-265.000.
Mundie, Craig J.: *See*—
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Gavrin, Edward S.; Bratt, Richard G.; Schleimer, Stephen I.; Pilat, John F.; Richmond, Michael S.; Wallach, Walter A., Jr.; Belgard, Richard A.; Farber, David A.; Ahlstrom, John K.; Wallach, Steven J.; Clancy, Gerald F.; Mundie, Craig J.; Jones, Thomas M.; Bachman, Brett L.; and Bernstein, David H., 4,493,023, Cl. 364-200.000.
Munnich, Wilhelm; and Batke, Manfred, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Air-flow equipped turning bar for web material. 4,492,328, Cl. 226-197.000.
Munslow-Davies, Keith: *See*—
Begley, Maxwell G.; and Munslow-Davies, Keith, 4,492,005, Cl. 24-270.000.
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Goto, Tadahiko; Oniki, Kiyoshi; Murakami, Satoshi; Yokooji, Mitsunori; Andou, Norio; and Shimojyo, Norio, 4,492,906, Cl. 318-488.000.
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Muramatsu, Toshihiko; Kobayashi, Akio; Kondo, Toshio; Isomura, Shigenori; and Eino, Tomomi, to Nippondenso Co., Ltd. Fuel injection control. 4,492,202, Cl. 123-478.000.
Murao, Mikio: *See*—
Suzuki, Takeshi; Murao, Mikio; Uchida, Masahiro; Kumagai, Chikanori; and Yotsui, Yasuhiko, 4,492,570, Cl. 432-106.000.
Muraoka, Shigetaro; and Sakamoto, Mineo. Anti-howl back device. 4,493,101, Cl. 381-93.000.
Murata Manufacturing Co., Ltd.: *See*—
Nakatani, Hiroshi, 4,492,892, Cl. 310-345.000.
Sugitani, Masami, 4,493,007, Cl. 361-307.000.

Murphy, Davis J.; and Phillips, Leslie N., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Materials suitable for thermosetting. 4,492,732, Cl. 428-404.000.

Murphy, Richard D.; and Coope, Daniel F., to NL Industries, Inc. Borehole influx detector and method. 4,492,865, Cl. 250-265.000.

Muschaweck, Roman: *See*—
Merkel, Wulf; Bormann, Dieter; and Muschaweck, Roman, 4,492,710, Cl. 424-274.000.

Muzyczko, Thaddeus M.: *See*—
Pala, Jerome; Karmell, Yale; and Muzyczko, Thaddeus M., 4,492,012, Cl. 29-148.40D.

Nabben, Hendrikus J. P.: *See*—
Joosten, Paul H.; Popma, Theo J. A.; Nabben, Hendrikus J. P.; Van Hal, Henricus A. M.; and Haisma, Jan, 4,492,721, Cl. 427-226.000.

Nabisco Brands, Inc.: *See*—
Horwath, Robert O.; and Colonna, William J., 4,492,755, Cl. 435-94.000.

Nagata, Minoru: *See*—
Yoshida, Isao; Okabe, Takeaki; Katsueda, Mineo; Nagata, Minoru; Masuhara, Toshiaki; Ashikawa, Kazutoshi; Kato, Hideaki; Ito, Mitsuo; Ohtaka, Shigeo; Minato, Osamu; and Sakai, Yoshio, 4,492,974, Cl. 357-23.000.

Nagel, Harry H., to Heinemann Electric Company. Circuit breaker comprising parallel connected sections. 4,492,941, Cl. 335-13.000.

Nagpal, Krishen L., to Buffalo Color Corporation. Method for inhibiting the growth of fungi with phenyl glycine compounds. 4,492,683, Cl. 424-309.000.

Nagy, Gabor: *See*—
Szekely, Tamas; Csanda, Ferenc; Nagy, Gabor; and Czerny, Gyozo, 4,492,494, Cl. 405-264.000.

Naito, Ryuichi; and Hirano, Hiroyuki, to Pioneer Electronic Corporation. Pick-up point dislocation detecting device in recording a disc player. 4,493,068, Cl. 369-44.000.

Nakada, Akira: *See*—
Oya, Akiyoshi; Nakada, Akira; and Suzuki, Tutomu, 4,492,142, Cl. 84-1.030.

Nakahara, Takeshi: *See*—
Nakashima, Kazuhide; Saito, Takayuki; Nakahara, Takeshi; and Tanaka, Shigeo, 4,492,789, Cl. 525-531.000.

Nakai, Mamoru: *See*—
Fujii, Kozo; Nishihira, Keigo; Sawada, Hiroyuki; Tanaka, Shuji; Nakai, Mamoru; Yoshida, Hiroshi; and Inoue, Teruhiko, 4,492,792, Cl. 544-326.000.

Nakakooji, Hiroshi: *See*—
Mochida, Haruo; Nakakooji, Hiroshi; and Namazue, Hirotoshi, 4,492,959, Cl. 340-825.560.

Nakamura, Junichi: *See*—
Oinoue, Kenichi; Hayashi, Asao; Nakamura, Junichi; Ida, Masatoshi; Aoki, Masahiro; and Fukuoka, Kenji, 4,492,449, Cl. 354-407.000.

Nakamura, Takashi: *See*—
Ito, Yasuro; Higuchi, Yoshiro; Tsuji, Masanori; Yamamoto, Yasuhiro; Tada, Hiroshi; Kuroha, Kenji; Nakamura, Takashi; and Tomikawa, Koichi, 4,492,478, Cl. 366-28.000.

Nakamura, Toshiaki: *See*—
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,492,515, Cl. 415-53.00T.

Nakamura, Yoichi: *See*—
Hiratsuka, Kosai; Nakamura, Yoichi; Maruko, Morihisa; Matsuura, Yoshio; and Kurihara, Michio, 4,492,638, Cl. 210-728.000.

Nakanishi, Nobuyasu: *See*—
Kozakai, Asao; Watanabe, Shingo; and Nakanishi, Nobuyasu, 4,492,414, Cl. 303-116.000.

Nakanishi, Tosaku: *See*—
Hashimoto, Shintaro; Morimoto, Masafumi; Nakanishi, Tosaku; Yoshida, Hideo; and Yanagiuchi, Shigenobu, 4,493,050, Cl. 364-900.000.

Nakashima, Kazuhide; Saito, Takayuki; Nakahara, Takeshi; and Tanaka, Shigeo, to Hitachi Chemical Company, Ltd. Epoxy resin composition. 4,492,789, Cl. 525-531.000.

Nakasone, Seiken; Miyagi, Sadao; Aragaki, Takehiko; and Higa, Yasusi, to Daiichi Seito Kabushiki Kaisha; and Taito Kabushiki Kaisha. Process for clarifying and desalinating sugar cane syrup or molasses. 4,492,601, Cl. 127-48.000.

Nakatani, Hiroshi, to Murata Manufacturing Co., Ltd. Piezoelectric resonator device supported by anisotropic rubber conductor. 4,492,892, Cl. 310-345.000.

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Mochida, Haruo; Nakakooji, Hiroshi; and Namazue, Hirotoshi, 4,492,959, Cl. 340-825.560.

Narayanan, Swami: *See*—
Johnson, Axel R.; Narayanan, Swami; and Woebcke, Herman N., 4,492,624, Cl. 208-78.000.

Narita, Katsumi: *See*—
Hayakawa, Daishiro; Akimoto, Masao; Narita, Katsumi; and Tani, Kenroku, 4,492,928, Cl. 330-126.000.

National Distillers and Chemical Corporation: *See*—
Braus, Harry, 4,492,647, Cl. 252-573.000.

National Research Development Corporation: *See*—
Hopkins, Harold H., 4,492,441, Cl. 350-516.000.
Singleton, Terence, 4,492,224, Cl. 128-75.000.

National Semiconductor Corporation: *See*—
Anderson, James M.; Knight, Thomas S., III; Kitagawa, Dennis T.; and Rey, Ernesto, 4,493,075, Cl. 371-10.000.

Nattrass, Frank. Flexible bulk container with integral lifting loops. 4,493,109, Cl. 383-7.000.

Naumann, Leo J., to BS&B Safety System, Inc. Apparatus for manufacturing rupture disks. 4,492,103, Cl. 72-55.000.

Neal, Peter F., to Rolls-Royce Limited. Gas turbine engine bearing support structure. 4,492,518, Cl. 415-142.000.

Nealon, James T.: *See*—
Bachman, Brett L.; Nealon, James T.; and Young, Charles J., 4,493,025, Cl. 364-200.000.

Near, Timothy P., to General Electric Company. Synchronization fuel control for gas turbine-driven AC generator by use of maximum and minimum fuel signals. 4,492,874, Cl. 290-40.00B.

Nebelung, Hermann H.; and Knoth, Werner-Dieter, to Emhart Industries, Inc. Bottom plate mechanism for a mould of a glassware container manufacturing machine. 4,492,595, Cl. 65-263.000.

Nebu, Hideaki: *See*—
Ohmori, Yoshitaka; and Nebu, Hideaki, 4,492,250, Cl. 137-590.000.

Necchi Societa per Azioni: *See*—
Bar, Alfredo, 4,492,886, Cl. 310-68.00C.

Negus, Clive R.: *See*—
Drain, Leslie E.; and Negus, Clive R., 4,492,467, Cl. 356-336.000.

Neitz, Alfred, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method of operating internal combustion engines. 4,492,193, Cl. 123-276.000.

Nelle, Gunther, to Dr. Johannes Heidenhain GmbH. Coupling arrangement for length measuring device. 4,492,032, Cl. 33-125.00R.

Nelson Irrigation Corporation: *See*—
Kreitzberg, Jeffrey P., 4,492,339, Cl. 239-230.000.

Nelson, Leonard Y.: *See*—
Grynberg, Jack; Nelson, Leonard Y.; and Moody, Stephen E., 4,492,862, Cl. 250-255.000.

Neomed, Incorporated: *See*—
Taylor, Glenn N., 4,492,832, Cl. 200-52.00R.

Nettesheim, Daniel R.; and Kufrin, Fred W., to Schwaab Inc. Type band ink stamp. 4,492,162, Cl. 101-103.000.

Neubauer, Gerald: *See*—
Frank, Gerhard; Rudolf, Peter; Neubauer, Gerald; Duffner, Paul; Ohlinger, Manfred; Wilfinger, Hans J.; and Pfannebecker, Emil, 4,492,804, Cl. 564-493.000.

Nguyen-Dinh, Xuan: *See*—
Duhl, David N.; and Nguyen-Dinh, Xuan, 4,492,672, Cl. 420-448.000.

Nicia, Antonius J. A.; and Potters, Cornelis J. T., to U.S. Philips Corporation. Optical branch coupler. 4,492,426, Cl. 350-96.150.

Nicolas, Alain; and Chapelain, Jean-Pierre, to Thomson-CSF Telephone. Centralized arbitration process and centralized arbiter for multiprocessor system. 4,493,022, Cl. 364-200.000.

Nicolau, Ion F.: *See*—
Averbuch, Marie-Therese; Durif-Varambon, Andre ; Gauthier, Sylviane; Nicolau, Ion F.; and Peuzin, Jean C., 4,492,857, Cl. 250-211.00R.

Nieh, Edward C. Y.: *See*—
McEntire, Edward E.; Sellstrom, Kathy B.; Nieh, Edward C. Y.; and Livingston, David R., 4,492,801, Cl. 564-135.000.

Nikkan Industries Co., Ltd.: *See*—
Oishi, Nacaki; Shimizu, Noriyuki; Shoji, Takashi; and Harada, Shoji, 4,492,730, Cl. 428-328.000.

Nikolaus, Peter: *See*—
Rutzen, Horst; Nikolaus, Peter; Bischoff, Martin; and Lehmann, Rudolf, 4,492,802, Cl. 564-292.000.

Nilsson, Bruno Y., to Boliden Aktiebolag. Method and apparatus for ore prospecting utilizing an aerial transmitter and aerial receiver. 4,492,924, Cl. 324-330.000.

Ning, Tak H.: *See*—
Anantha, Narasipur G.; Ning, Tak H.; and Tsang, Paul J., 4,492,008, Cl. 29-571.000.

Nippon Electric Co., Ltd.: *See*—
Yazawa, Akira, 4,493,095, Cl. 377-107.000.

Nippon Electric Co., Ltd: *See*—
Watanabe, Tadashi, 4,493,046, Cl. 364-717.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Oya, Akiyoshi; Nakada, Akira; and Suzuki, Tutomu, 4,492,142, Cl. 84-1.030.

Nippon Hoso Kyokai: *See*—
Taketoshi, Kazuhisa; and Ogusu, Chihaya, 4,492,981, Cl. 358-217.000.

Nippon Soken, Inc.: *See*—
Ozaki, Tadashi; Hattori, Tadashi; Miura, Kazuhiko; Hanaoka, Masanori; and Hashiguchi, Yukihide, 4,492,109, Cl. 73-35.000.
Takagi, Shigeru; and Hayashi, Nobutoshi, 4,492,079, Cl. 60-274.000.

Nippon Steel Corporation: *See*—
Otabe, Norio; Shimakawa, Yoshiaki; and Uematsu, Hiroshi, 4,492,042, Cl. 34-35.000.

Nippon Telegraph & Telephone Public Corporation: *See*—
Matsuo, Seitaro; and Ono, Toshiro, 4,492,620, Cl. 204-192.00R.

Nippondenso Co., Ltd.: *See*—
Miyaki, Masahiko; Masuda, Akira; and Matsumura, Toshimi, 4,492,534, Cl. 417-386.000.
Muramatsu, Toshihiko; Kobayashi, Akio; Kondo, Toshio; Isomura, Shigenori; and Eino, Tomomi, 4,492,202, Cl. 123-478.000.
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,492,515, Cl. 415-53.00T.
Yamamoto, Noboru; Okuda, Ryoichi; and Makino, Tomoatsu, 4,492,213, Cl. 123-644.000.

Nisato, Dino; and Boveri, Sergio, to SANOFI. Benzamides, their salts, and pharmaceutical compositions containing them. 4,492,711, Cl. 424-285.000.

Nishihara, Yasuhiro: *See*—
Takashima, Ryokichi; Goko, Nobuaki; Uehara, Yumito; Nishihara, Yasuhiro; and Yamamoto, Hidetoshi, 4,492,787, Cl. 525-53.000.

Nishihira, Keigo: *See*—
Fujii, Kozo; Nishihira, Keigo; Sawada, Hiroyuki; Tanaka, Shuji; Nakai, Mamoru; Yoshida, Hiroshi; and Inoue, Teruhiko, 4,492,792, Cl. 544-326.000.

Nishina, Shingo; Takahashi, Seigo; and Ohtani, Shigeru, to Mitutoyo Mfg. Co., Ltd. Displacement measuring device. 4,492,034, Cl. 33-170.000.

Nishioka, Kimihiko, to Olympus Optical Co., Ltd. Finder optical system. 4,492,440, Cl. 350-445.000.

Niskin, Shale J. Multiple pulley sheave assembly with retainer pulleys. 4,492,363, Cl. 254-394.000.

Nissan Motor Company, Limited: *See*—
Chikaraishi, Takayo; Tuchiya, Yosimasa; and Kawamo, Kazunori, 4,492,405, Cl. 296-146.000.
Hasegawa, Hideo, 4,492,129, Cl. 74-473.00R.
Kubota, Toru; Tamate, Masazi; and Sauzu, Masaaki, 4,492,955, Cl. 340-636.000.
Mochida, Haruo; Nakakooji, Hiroshi; and Namazue, Hirotoshi, 4,492,959, Cl. 340-825.560.
Ogawa, Naoki; and Toda, Akira, 4,492,189, Cl. 123-90.380.
Takahashi, Toru; and Ueno, Takashi, 4,492,195, Cl. 123-339.000.
Tanaka, Yoshiyuki, 4,492,101, Cl. 70-370.000.

Nissan Shatai Company, Limited: *See*—
Chikaraishi, Takayo; Tuchiya, Yosimasa; and Kawamo, Kazunori, 4,492,405, Cl. 296-146.000.
Matsubara, Tooru, 4,492,406, Cl. 296-217.000.

Niweigha, Tiefa K.: *See*—
Lee, Francis C.; Mills, Ross N.; Niweigha, Tiefa K.; and Talke, Frank E., 4,492,968, Cl. 346-140.00R.

NL Industries, Inc.: *See*—
Murphy, Richard D.; and Coope, Daniel F., 4,492,865, Cl. 250-265.000.

Nogai, Akira, to Yoshida Kogyo K. K. Apparatus for manufacturing a continuous slide fastener stringer. 4,492,547, Cl. 425-111.000.

Noguchi, Takaharu: *See*—
Arai, Takao; and Noguchi, Takaharu, 4,492,997, Cl. 360-113.000.

Nolting, Eugene C.: *See*—
Johnson, Gerald L.; Nolting, Eugene C.; and Allen, John H., 4,492,161, Cl. 101-109.000.

Norris, Philip R., to Polaroid Corporation. Photographic film assemblage with means for establishing a gap between a pair of pressure-applying assemblies. 4,492,445, Cl. 354-180.000.

North American Van Lines, Inc.: *See*—
Gasper, John S., 4,492,499, Cl. 410-32.000.

Norton, James P.; and Golan, Lawrence P., to Exxon Research and Engineering Co. Solids cooling. 4,492,184, Cl. 122-4.00D.

Nowakowski, Robert J., to General Motors Corporation. Dual voltage motor vehicle electrical system. 4,492,912, Cl. 320-6.000.

Nu-Tech Industries, Inc.: *See*—
Knight, John H.; and Isaacson, Milton S., 4,492,903, Cl. 318-341.000.

Oakes, Martin C. Electrical switchgear. 4,492,831, Cl. 200-50.00A.

Oberhauser, Louis B.: *See*—
Blomgren, Kenneth E.; and Oberhauser, Louis B., 4,492,403, Cl. 296-65.00R.

Obert, Wolfgang: *See*—
Rohner, Peter; Schippl, Klausdieter; Blumenberg, Gunther; Meyer, Werner; and Obert, Wolfgang, 4,492,089, Cl. 62-55.000.

Obey, Richard P. Lid removal tool. 4,492,132, Cl. 81-3.10R.

Obrist, Albert, to Albert Obrist AG. Closure apparatus with magnetic coupling for screwing on a plastics screw closure. 4,492,068, Cl. 53-331.500.

Oce-Nederland B.V.: *See*—
Breuers, Theo P. C.; Heijnen, Andreas T.; and Leppink, Arie, 4,492,138, Cl. 83-203.000.

O'Dell, Gerald W.: *See*—
Lee, Leighton, II; O'Dell, Gerald W.; and Holtermann, Ludwig K., 4,492,360, Cl. 251-129.000.

Odero, Dominique; and Parent, Guy, to Sintra-Alcatel. Sonar System. 4,493,064, Cl. 367-92.000.

Oelwein State Bank, administrator: *See*—
Lorence, Allan L.; Maring, Thomas L.; and Rawson, James L., deceased, 4,492,372, Cl. 272-1.00C.

Oetiker, Hans. Earless clamp structure. 4,492,004, Cl. 24-20.00R.

Ogawa, Atsushi: *See*—
Kusakabe, Hiromi; and Ogawa, Atsushi, 4,492,926, Cl. 329-205.00R.

Ogawa, Hiroshi; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,492,734, Cl. 428-424.200.

Ogawa, Hiroshi; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,492,735, Cl. 428-424.200.

Ogawa, Naoki; and Toda, Akira, to Nissan Motor Company, Ltd. Rocker cover assembly. 4,492,189, Cl. 123-90.380.

Ogawa, Toshihisa: *See*—
Kawai, Yukio; Ogawa, Toshihisa; and Yoshida, Seietsu, 4,492,199, Cl. 123-440.000.

Ogilvy, James J.: *See*—
Jullien, Graham A., 4,492,896, Cl. 315-153.000.

Ogura, Mitsugi, to Tokyo Shibaura Denki Kabushiki Kaisha. MOS Dynamic memory cells and method of fabricating the same. 4,492,973, Cl. 357-23.000.

Ogusu, Chihaya: *See*—
Taketoshi, Kazuhisa; and Ogusu, Chihaya, 4,492,981, Cl. 358-217.000.

Ohga, Suehisa: *See*—
Asano, Yuichiro; Hirahashi, Akira; Ohga, Suehisa; Yabe, Tadashi; Kurita, Kunio; and Momose, Atsushi, 4,492,472, Cl. 356-376.000.

Ohkubo, Hiroyuki, to Sony Corporation. Magnetic sensor with two series-connected magnetoresistive elements and a bias magnet for sensing the proximity of a relatively movable magnetically permeable member. 4,492,922, Cl. 324-207.000.

Ohlinger, Manfred: *See*—
Frank, Gerhard; Rudolf, Peter; Neubauer, Gerald; Duffner, Paul; Ohlinger, Manfred; Wilfinger, Hans J.; and Pfannebecker, Emil, 4,492,804, Cl. 564-493.000.

Ohmori, Yoshitaka; and Nebu, Hideaki, to Honda Giken Kogyo Kabushiki Kaisha. Fuel tank for motor vehicles. 4,492,250, Cl. 137-590.000.

Ohmura, Hideo: *See*—
Miyano, Toshiyuki; and Ohmura, Hideo, 4,492,072, Cl. 53-586.000.

Ohnishi, Masaru; and Saito, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Thermal transfer printing method. 4,492,965, Cl. 346-1.100.

Ohnishi, Shunsaku: *See*—
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,492,515, Cl. 415-53.00T.

Ohta, Noboru: *See*—
Murakami, Yoshihiko; and Ohta, Noboru, 4,492,552, Cl. 425-218.000.

Ohta, Yoshikatsu: *See*—
Kanai, Tamaki; Yoshikawa, Hirofumi; Yamagishi, Takashi; Suzuki, Kenji; and Ohta, Yoshikatsu, 4,492,719, Cl. 427-171.000.

Ohtaka, Shigeo: *See*—
Yoshida, Isao; Okabe, Takeaki; Katsueda, Mineo; Nagata, Minoru; Masuhara, Toshiaki; Ashikawa, Kazutoshi; Kato, Hideaki; Ito, Mitsuo; Ohtaka, Shigeo; Minato, Osamu; and Sakai, Yoshio, 4,492,974, Cl. 357-23.000.

Ohtani, Shigeru: *See*—
Nishina, Shingo; Takahashi, Seigo; and Ohtani, Shigeru, 4,492,034, Cl. 33-170.000.

Ohtsuki, Zenju: *See*—
Inami, Mamoru; Tanaka, Yoshiaki; and Ohtsuki, Zenju, 4,492,917, Cl. 324-77.00A.

Oinoue, Kenichi; Hayashi, Asao; Nakamura, Junichi; Ida, Masatoshi; Aoki, Masahiro; and Fukuoka, Kenji, to Olympus Optical Co. Ltd. Apparatus and technique for detecting and controlling the focusing of an optical system by image sharpness and lateral shift techniques. 4,492,449, Cl. 354-407.000.

Oishi, Naoaki; Shimizu, Noriyuki; Shoji, Takashi; and Harada, Shoji, to Showa Denko Kabushiki Kaisha; and Nikkan Industries Co., Ltd. Substrate of printed circuit. 4,492,730, Cl. 428-328.000.

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Akazawa, Hiroyuki; and Yoshiie, Kazue, 4,492,484, Cl. 400-248.000.

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Tanaka, Taku; Maruyama, Hitoshi; Okaya, Takuji; and Kajitani, Koichi, 4,492,783, Cl. 524-430.000.

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Yamamoto, Noboru; Okuda, Ryoichi; and Makino, Tomoatsu, 4,492,213, Cl. 123-644.000.

Okumura, Shigeo, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Advancing mechanism for internal combustion engines. 4,492,198, Cl. 123-413.000.

Olnowich, Howard T., to International Business Machines Corporation. Set associative sector cache. 4,493,026, Cl. 364-200.000.

Olsen, Willi: *See*—
Lorenz, Dieter; and Olsen, Willi, 4,493,009, Cl. 361-341.000.

Olson, Scott B. Skate having an adjustable blade or wheel assembly. 4,492,385, Cl. 280-7.130.

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Kimura, Kenji, 4,492,856, Cl. 250-201.000.
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Mizokami, Kazunori, 4,492,858, Cl. 250-214.00P.
Nishioka, Kimihiko, 4,492,440, Cl. 350-445.000.
Oinoue, Kenichi; Hayashi, Asao; Nakamura, Junichi; Ida, Masatoshi; Aoki, Masahiro; and Fukuoka, Kenji, 4,492,449, Cl. 354-407.000.
Saito, Shoichi; and Shirako, Hideo, 4,492,417, Cl. 312-9.000.

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Ishikawa, Norio; and Omaki, Takanobu, 4,492,448, Cl. 354-406.000.

Omata, Takashi, to Canon Kabushiki Kaisha. Projection printing apparatus for printing a photomask. 4,492,459, Cl. 355-43.000.

Oniki, Kiyoshi: *See*—
Goto, Tadahiko; Oniki, Kiyoshi; Murakami, Satoshi; Yokooji, Mitsunori; Andou, Norio; and Shimojyo, Norio, 4,492,906, Cl. 318-488.000.

Ono, Toshiro: *See*—
Matsuo, Seitaro; and Ono, Toshiro, 4,492,620, Cl. 204-192.00R.

Optilon W. Erich Heilmann GmbH: *See*—
Heimberger, Helmut, 4,492,098, Cl. 66-202.000.

Orban, Ivan; and Troxler, Eduard, to Ciba-Geigy Corporation. Process for the preparation of polyaminotriazines. 4,492,791, Cl. 544-198.000.

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Ortho Diagnostics Systems Inc.: *See*—
Hoffman, Robert A.; and Ip, Stephen H. C., 4,492,752, Cl. 435-7.000.

Osada, Noboru; Kanamori, Akira; Kimura, Takashi; Moroto, Seiro; Horie, Hideo; and Yoshizoe, Teruhide, to Fujitsu Limited. Method and apparatus for controlling the stepping feed of an information medium. 4,492,991, Cl. 360-70.000.

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Meinander, Paul O., 4,492,611, Cl. 162-358.000.

Oshizawa, Hidekazu, to Diesel Kiki Co., Ltd. Electronically controlled fuel injection apparatus. 4,492,196, Cl. 123-357.000.

Osman, Ismet M. P. M., to Burroughs Corporation. Wafer-scale integrated circuits. 4,493,055, Cl. 365-78.000.

Ostlinning, Gunter: *See*—
Kutz, Heinrich; Ostlinning, Gunter; and Jung, Gerd, 4,492,105, Cl. 72-302.000.

Otabe, Norio; Shimakawa, Yoshiaki; and Uematsu, Hiroshi, to Nippon Steel Corporation. Method for drying coking coals to be charged in a coke oven. 4,492,042, Cl. 34-35.000.

Otani, Junji; Ikenoya, Yasuo; and Araki, Masafumi, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust gas recirculation system. 4,492,209, Cl. 123-568.000.

Otis, Douglas A., to Rosstream Research Associates, Ltd. Magnetic recording tape and corresponding method providing indication of end-of-tape conditions. 4,492,993, Cl. 360-74.500.

Otto, Eberhard: *See*—
Maul, Rudolf; Otto, Eberhard; and Zinke, Horst, 4,492,661, Cl. 260-976.000.

Otto Tuchenhagen GmbH & Co. KG: *See*—
Stahlkopf, Friedrich R. R., 4,492,535, Cl. 417-394.000.

Ovshinsky, Herbert C.; and Izu, Masatsugu, to Sovonics Solar Systems. Apparatus for continuously producing tandem amorphous photovoltaic cells. 4,492,181, Cl. 118-718.000.

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Owen, Bruce R.; and Sarle, R. Charles, to Wallace Murray Corporation. Turbocharger exhaust gas by-pass valve. 4,492,519, Cl. 415-145.000.

Owen, Richard: *See*—
Lee, Charles C.; and Owen, Richard, 4,492,970, Cl. 346-160.000.

Owens-Corning Fiberglas Corporation: *See*—
Ritter, George W., II; and Adzima, Leonard J., 4,492,722, Cl. 427-226.000.

Oy Kontekla: *See*—
Lunden, Risto; and Ebeling, Olavi, 4,492,491, Cl. 405-119.000.

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Ozaki, Tadashi; Hattori, Tadashi; Miura, Kazuhiko; Hanaoka, Masanori; and Hashiguchi, Yukihide, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Knocking detection apparatus for an internal combustion engine. 4,492,109, Cl. 73-35.000.

Ozawa, Isao; Aono, Yukio; and Ueno, Masato, to Toyoda Gosei Co., Ltd. Elastically damping device for the suspension of an engine. 4,492,366, Cl. 267-140.100.

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Kawada, Tetsuo; and Ozawa, Yoshio, 4,492,457, Cl. 355-38.000.

PA Incorporated: *See*—
Kahil, John E.; Jaynes, Mark S.; and Bradfield, James E., 4,492,115, Cl. 73-151.000.

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Bixler, Kenneth D.; Reifers, Richard F.; and Lord, Henry A., 4,492,331, Cl. 229-2.5BC.

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Kljuchko, Gennady V.; Padalka, Valentin G.; Sablev, Leonid P.; and Stupak, Rimma I., 4,492,845, Cl. 219-121.00P.

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Pakosh, Daniel, to Versatile Cornat Corporation. Rotary combine. 4,492,237, Cl. 130-27.00R.

Pala, Jerome; Karmell, Yale; and Muzyczko, Thaddeus M., to Samuel Bingham Company. Method of making roll for use in printing. 4,492,012, Cl. 29-148.40D.

Palmer, Dennis C.; and Palmer, Edward B. Internal combustion engine. 4,492,188, Cl. 123-58.00R.

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Palmer, Dennis C.; and Palmer, Edward B., 4,492,188, Cl. 123-58.00R.

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Hoeren Gerd H.; and Palmquist, Steven R., 4,493,044, Cl. 364-579.000.

Palz, Helmut, to Didier-Werke AG. Process and apparatus for preheating the combustion mediums used for firing blast furnace stoves. 4,492,568, Cl. 432-30.000.

Panetti, Romolo, to Speno International S.A. Grinding device for the reprofiling of a rail of a railway track. 4,492,059, Cl. 51-178.000.

Pano, Joseph, to Iscar Ltd. Rotary slot cutting tools having replaceable inserts and replaceable seats. 4,492,140, Cl. 83-839.000.

Panock, Richard L.: *See*—
Forrest, Stephen R.; and Panock, Richard L., 4,493,113, Cl. 455-606.000.

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Guillon, Michel; Mondet, Jean; Papantoniou, Christos; and Vandenbossche, Claudine, 4,492,686, Cl. 424-61.000.

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Odero, Dominique; and Parent, Guy, 4,493,064, Cl. 367-92.000.

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Ficken, William; Sears, Jerome; and Parfomak, Walter, 4,492,902, Cl. 318-254.000.

Park, Joon B., to Clemson University. Method of orthopedic implantation and implant product. 4,491,987, Cl. 3-1.910.

Park, Kyoo P. Quick release clamping device. 4,492,370, Cl. 269-182.000.

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Schaub, Erwin L., 4,492,393, Cl. 285-236.000.

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Pasteris, Robert J., to Du Pont de Nemours, E. I., and Company. Phenyl-substituted sulfonamides. 4,492,596, Cl. 71-90.000.

Patent-Treuhand Gesellschaft fur elektrische Gluhlampen GmbH: *See*—
Steiner, Hermann; and Schonherr, Walter, 4,492,893, Cl. 313-318.000.

Paterson Product Ltd.: *See*—
Taylor, Eric, 4,492,447, Cl. 354-312.000.

Patterson, Richard H.: *See*—
Geller, Myer; Keenan, Thomas E.; Altman, Daniel E.; and Patterson, Richard H., 4,493,114, Cl. 455-617.000.

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Wilson, Frank G.; and Patton, William A., 4,491,998, Cl. 15-119.00A.

Paul Forkardt GmbH & Co, KG: *See*—
Antoni, Herbert, 4,493,041, Cl. 364-474.000.

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Weaver, Henry; and Pawlush, Joseph C., 4,492,104, Cl. 72-56.000.

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Eriksen, Wilbur R.; and Payne, Harry E., Jr., 4,492,673, Cl. 422-85.000.

Peachee, C. Theodore; and Messner, Daniel R., to Emerson Electric Co. Wire way securement means for dynamoelectric machine. 4,492,888, Cl. 310-71.000.

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Insley, Gene L.; Seaburg, Duane M.; and Pearce, Daniel S., 4,493,069, Cl. 369-75.100.

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Guess, Joe F.; and Pearce, Thomas, 4,492,317, Cl. 222-39.000.

Pelowski, Kenneth R.; and Winkel, Robert J., to Westinghouse Electric Corp. Electronic circuit breaker. 4,493,002, Cl. 361-93.000.

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Brede, Uwe; Horr, Alfred; and Penner, Horst, 4,492,167, Cl. 102-470.000.

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Saitoh, Kazunori, 4,492,567, Cl. 432-30.000.

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Abe, Kiyomi, 4,492,818, Cl. 178-18.000.

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Warrin, George E.; and Perdreaux, Rene J., 4,492,574, Cl. 433-81.000.

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Garczynski, John S.; Reed, Frank J.; Hahn, Jeffrey C.; and Dobson, John J., 4,492,855, Cl. 235-458.000.

Perkin-Elmer Corporation, The: *See*—
Clayton, Robert H., 4,493,097, Cl. 378-137.000.
Gould, Gerald, 4,492,669, Cl. 419-5.000.

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Belykh, Sergei I.; Moschensky, Anatoly D.; Davydov, Anatoly B.; Pershin, Gely G.; Smirnov, Boris A.; and Gromov, Mikhail V., 4,492,226, Cl. 128-92.0BC.

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Stahl, Charles R.; and Perugi, Archie H., 4,492,085, Cl. 60-649.000.

Peter, Dietmar, to Dr. Ing. h.c.F. Porsche AG. Resilient vehicle bumper indirectly secured to a rigid support. 4,492,398, Cl. 293-120.000.

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Levitt, George; and Petersen, Wallace C., 4,492,599, Cl. 71-93.000.

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Petrimaux, Eric: *See*—
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Bellos, Thomas J., 4,492,658, Cl. 260-455.00A.
PetroSystems International, Inc.: *See*—
Hallberg, John E., 4,492,207, Cl. 123-527.000.
Peuzin, Jean C.: *See*—
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Frank, Gerhard; Rudolf, Peter; Neubauer, Gerald; Duffner, Paul; Ohlinger, Manfred; Wilfinger, Hans J.; and Pfannebecker, Emil, 4,492,804, Cl. 564-493.000.
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Pfister, Jean-Francois. Intermittent drive arrangement. 4,492,905, Cl. 318-470.000.
Pfizer Inc.: *See*—
Bright, Gene M., 4,492,688, Cl. 424-180.000.
Phan, Xuan T.; and Shannon, Paul J. Photochemical process for preparing alkoxy substituted compounds. 4,492,619, Cl. 204-158.00R.
Pharos AB: *See*—
Wiklund, Klas R., 4,492,471, Cl. 356-375.000.
Philip Morris Incorporated: *See*—
Wheless, Jack C., 4,492,238, Cl. 131-94.000.
Philipp Holzmann AG: *See*—
Schafer, Hans; and Gaschler, Michael, 4,492,087, Cl. 62-45.000.
Phillips, Bryan D. Aircraft capable of vertical short takeoff and landing. 4,492,353, Cl. 244-12.400.
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Phillips, Leslie N.: *See*—
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Boultinghouse, Harold D , 4,492,784, Cl. 524-473.000.
Hawley, Gil R., 4,492,768, Cl. 502-111.000.
Kukes, Simon G., 4,492,626, Cl. 208-251.00H.
Tims, Harold A.; Elliott, Sheldon E.; Montgomery, Orin C.; and Doggett, William N., 4,493,063, Cl. 367-77.000.
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Phillips, Richard A.; and Haddad, Theodore A., to Foster Grant Corporation. Method of making an abrasion resistant coating on a solid substrate and articles produced thereby. 4,492,733, Cl. 428-412.000.
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Gavrin, Edward S.; Bratt, Richard G.; Schleimer, Stephen I.; Pilat, John F.; Richmond, Michael S.; Wallach, Walter A., Jr.; Belgard, Richard A.; Farber, David A.; Ahlstrom, John K.; Wallach, Steven J.; Clancy, Gerald F.; Mundie, Craig J.; Jones, Thomas M.; Bachman, Brett L.; and Bernstein, David H., 4,493,023, Cl. 364-200.000.
Katz, Lawrence H.; Wells, Douglas M.; Richmond, Michael S.; Belgard, Richard A.; Wallach, Walter A., Jr.; Bernstein, David H.; Ahlstrom, John K.; Pilat, John F.; Farber, David A.; Bratt, Richard G.; and Bachman, Brett L., 4,493,027, Cl. 364-200.000.
Pile, Donald L. Apparatus for balancing skeletal alignment. 4,492,236, Cl. 128-781.000.
Pilgrim, Lawrence G., Jr.; and Jackson, Leigh F., to Westinghouse Electric Corp. Apparatus and method for preventing the rotation of rods used in nuclear fuel assemblies. 4,492,668, Cl. 376-440.000.
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Kamimura, Testuro; and Matsuki, Seiichiro, 4,492,998, Cl. 360-132.000.
Naito, Ryuichi; and Hirano, Hiroyuki, 4,493,068, Cl. 369-44.000.
Pioneer Packaging, Inc.: *See*—
Dgetluck, John, 4,492,350, Cl. 242-118.400.
Pirelli General plc: *See*—
Larrive, Christopher, 4,492,662, Cl. 264-40.100.
Pitney Bowes Inc.: *See*—
Clark, John I., 4,492,157, Cl. 101-71.000.
Clark, John I., 4,492,158, Cl. 101-71.000.
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Clark, John I.; and Eckert, Alton B., 4,492,160, Cl. 101-71.000.
Hooper, Clinton E., 4,492,315, Cl. 221-186.000.
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Cumberton, John; Foster, Alun E.; Rae, Alexander S.; Fernandes, Vernon J.; and Carter, Michael R., 4,493,082, Cl. 371-43.000.
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Pliskin, William A.; and Riseman, Jacob, to International Business Machines Corporation. Method for forming a planarized integrated circuit. 4,492,717, Cl. 427-96.000.
Poate, John M.: *See*—
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Pocock, Robert E., to Babcock & Wilcox Company, The. System for controlling combustibles and O_2 in the flue gases from combustion processes. 4,492,559, Cl. 431-12.000.
Pohl, Harold F. Door lifting and centering device for hanging heavy doors. 4,492,369, Cl. 269-60.000.
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Burkhardt, James L.; and McCann, John J., 4,492,987, Cl. 358-332.000.
Norris, Philip R., 4,492,445, Cl. 354-180.000.
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Woods, Arthur F.; Bush, Harry; and Kana, Eugene J., 4,492,392, Cl. 285-119.000.
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Poock, Darwin N., to FMC Corporation. External pendant pay-out system with anti-droop control. 4,492,312, Cl. 212-264.000.
Popma, Theo J. A.: *See*—
Joosten, Paul H.; Popma, Theo J. A.; Nabben, Hendrikus J. P.; Van Hal, Henricus A. M.; and Haisma, Jan, 4,492,721, Cl. 427-226.000.
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Sairanen, Martti; and Virta, Matti, 4,492,897, Cl. 315-219.000.
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Poulin, Gilles. Automatic hook setter. 4,492,053, Cl. 43-15.000.
Powell, Robert A., to Edison International, Inc. Arc resistant halogen headlamp and wiring scheme therefor. 4,492,895, Cl. 315-82.000.
PPG Industries, Inc.: *See*—
Curley, John E., 4,492,594, Cl. 65-134.000.
Tang, Robert H., 4,492,656, Cl. 260-453.0RZ.
Prappacher, Gerd: *See*—
Haberfellner, Fritz; Mennicke, Stefan; and Prappacher, Gerd, 4,492,742, Cl. 429-104.000.
Presby, Herman M.: *See*—
Marcuse, Dietrich; and Presby, Herman M., 4,492,463, Cl. 356-73.100.
Prescott, Robert C.; Gold, Calman; and Anderson, Eric V., to McGraw-Edison Company. Solid state current-to-pressure and current-to-motion transducer. 4,492,246, Cl. 137-85.000.
President and Directors of Georgetown University: *See*—
Gregory, William D., 4,493,039, Cl. 364-414.000.
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Price, Frank C., to USM Corporation. Machine for lasting heel seat portions of shoes. 4,491,997, Cl. 12-12.100.
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Maurer, Fritz; Priesnitz, Uwe; and Riebel, Hans-Jochem, 4,492,800, Cl. 562-506.000.
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Marcus, Konrad H.; and Fleming, Dennis J., 4,492,404, Cl. 296-97.00J.
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Pross, Wilhelm; Barry, Jurgen; Muhlbock, Franz; and Hartmann, Klaus. Photometric method for determining courses of reactions. 4,492,462, Cl. 356-39.000.
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Purcell, Thomas A., to Synthelabo. 2-[4(3)-Amino-3(4)-hydroxyphenylimino]-imidazolines, useful in the treatment of gastric hypersecretion and hyperacidity. 4,492,709, Cl. 424-273.00R.
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Reginier, Gilbert; Laubie, Michel; and Duhault, Jacques, to ADIR. Piperazine and homopiperazine compounds. 4,492,696, Cl. 424-249.000.
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Reinhold, Klaus, to Windmoller & Holscher. Burner for heating air and disposed in a passage through which air flows. 4,492,563, Cl. 431-264.000.
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Reuter, Wolfgang, to Leybold-Heraeus GmbH. Rotatable heavy-current connector. 4,492,423, Cl. 339-112.00L.
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Fujii, Kozo; Nishihira, Keigo; Sawada, Hiroyuki; Tanaka, Shuji; Nakai, Mamoru; Yoshida, Hiroshi; and Inoue, Teruhiko, 4,492,792, Cl. 544-326.000.
Saytar, Andrew. Arena type game. 4,492,380, Cl. 273-411.000.
Scans Associates, Inc.: *See*—
Van Allen, Kent; and Bordato, James M., 4,492,281, Cl. 177-213.000.
Scarlet, Richard I.; Andrews, James B.; and Henning, William F., II, to EG&G, Inc. Method and apparatus for determining lane count error in a radio navigational system. 4,492,963, Cl. 343-464.000.
Schad, Hanspeter: *See*—
Kaufmann, Meinolph; and Schad, Hanspeter, 4,492,432, Cl. 350-338.000.
Schafer, Hans; and Gaschler, Michael, to Philipp Holzmann AG; and Gg. Noell GmbH. Container for storing refrigerated liquids. 4,492,087, Cl. 62-45.000.
Schafer, James P.: *See*—
Whitwell, Robert J.; and Schafer, James P., 4,492,091, Cl. 62-180.000.
Schatz, Jack M.; and Gajda, Robert S. Lower extremity exerciser. 4,492,376, Cl. 272-138.000.
Schaub, Erwin L., to Parker Hannifin Corporation. Pipe restraint device. 4,492,393, Cl. 285-236.000.
Scheidler, Herwig, to JENAer Glaswerk Schott & Gen. Panel assembly, particularly a glass or vitreous ceramic heater or cooker panel assembly. 4,492,217, Cl. 126-39.00B.
Scheler, Siegfried, to Hoechst Aktiengesellschaft. Diazotype materials with 2-hydroxy-naphthalene having sulfonamide substituent as coupler. 4,492,749, Cl. 430-180.000.
Schelling, Bernd: *See*—
Arnold, Winfried; Locher, Johannes; and Schelling, Bernd, 4,492,913, Cl. 323-282.000.
Schering Corporation: *See*—
Sherlock, Margaret H., 4,492,702, Cl. 424-256.000.
Schick, Martin J.; and Kelley, Edwin L., to Diamond Shamrock Chemicals Company. Anionic dispersants for aqueous slurries of carbonaceous materials. 4,492,589, Cl. 44-51.000.
Schick, Martin J.; and Kelley, Edwin L., to Diamond Shamrock Chemicals Company. Stabilizers for oil slurries of carbonaceous material. 4,492,590, Cl. 44-51.000.
Schilling, Rainer: *See*—
Baumann, Fritz; Kranzler, Ernst; Radke, Siegmund; Schilling, Rainer; Fuchs, Wolfgang; and Ricker, Werner, 4,492,344, Cl. 242-1.000.
Schippl, Klausdieter: *See*—
Rohner, Peter; Schippl, Klausdieter; Blumenberg, Gunther; Meyer, Werner; and Obert, Wolfgang, 4,492,089, Cl. 62-55.000.
Schlaak, Helmut F.: *See*—
Kersten, Ralf T.; Tietgen, Karl H.; and Schlaak, Helmut F., 4,492,425, Cl. 350-96.140.
Schleimer, Stephen I.: *See*—
Gavrin, Edward S.; Bratt, Richard G.; Schleimer, Stephen I.; Pilat, John F.; Richmond, Michael S.; Wallach, Walter A., Jr.; Belgard, Richard A.; Farber, David A.; Ahlstrom, John K.; Wallach, Steven J.; Clancy, Gerald F.; Mundie, Craig J.; Jones, Thomas M.; Bachman, Brett L.; and Bernstein, David H., 4,493,023, Cl. 364-200.000.
Schlusener, Horst; and Hesse, Norbert, to Gewerkschaft Eisenhutte Westfalia. Apparatus for controlling the position of a mineral mining machine. 4,492,410, Cl. 299-43.000.
Schmidt, Frederick W., to Computer Automation, Inc. Dynamic memory with error correction on refresh. 4,493,081, Cl. 371-38.000.
Schmidt, Johan M., to U.S. Philips Corporation. FM Broadcasting system with transmitter identification. 4,493,099, Cl. 381-14.000.
Schneider, Thomas E.; and Funcik, Jack F., to Molex Incorporated. Electrical harness fabrication method and apparatus. 4,492,023, Cl. 29-861.000.
Schock & Co. GmbH: *See*—
Schock, Karl; and Frank, Lothar, 4,492,063, Cl. 52-309.700.
Schock, Karl; and Frank, Lothar, to Schock & Co. GmbH. Extruded plastics material hollow profiled strip for window frames, window frames produced from this type of profiled strips and method for the production of a window frame of this type. 4,492,063, Cl. 52-309.700.
Schoenheimer, Marcus F.; Gaskell, Lionel A.; and Ackermann, Keith A., to Actrol Industries Pty. Ltd. Valve and system incorporating same. 4,492,219, Cl. 126-427.000.
Schonherr, Walter: *See*—
Steiner, Hermann; and Schonherr, Walter, 4,492,893, Cl. 313-318.000.
Schonwald, Siegfried, to Siemens Aktiengesellschaft. Compressor unit. 4,492,530, Cl. 417-271.000.
Schosek, William O., to Elephant Industries, Inc. Underground pipe or cable installation. 4,492,133, Cl. 81-57.300.
Schosek, William O., to Elephant Industries, Inc. Light weight underground pipe or cable installing device. 4,492,274, Cl. 175-19.000.
Schramm, Matthias: *See*—
Goldmann, Siegfried; Boshagen, Horst; Stoltefuss, Jurgen; Schramm, Matthias; Thomas, Gunter; and Kazda, Stanislav, 4,492,703, Cl. 424-266.000.
Schreiber, Fred G.: *See*—
Gradeff, Peter S.; and Schreiber, Fred G., 4,492,655, Cl. 260-429.200.
Schreiber, Richard J.: *See*—
Kendall, Robert M.; Schreiber, Richard J.; and Kesselring, John P., 4,492,185, Cl. 122-32.000.
Schroder, Gunter: *See*—
Besecke, Siegmund; Schroder, Gunter; Ude, Werner; and Wunderlich, Winfried, 4,492,805, Cl. 568-012.000.
Schroder, Joris, to Inventio AG. Group control for elevators containing an apparatus for controlling the down-peak traffic. 4,492,288, Cl. 187-29.00R.
Schubert, Dale W.: *See*—
Peterson, Robert R.; Schubert, Dale W.; and Cholakis, Peter N., 4,492,949, Cl. 338-114.000.
Schulte, Wolfgang, to Jetform Heisskanalnormalien und Zubehor GmbH, Firma. Multiple hot runner injection bush. 4,492,555, Cl. 425-548.000.
Schultz, Ward E.: *See*—
Smith, Harry D., Jr.; and Schultz, Ward E., 4,492,864, Cl. 250-259.000.
Schulz, Siegmar: *See*—
Bathmann, Hans-Jurgen; Hoh, Bernhard; and Schulz, Siegmar, 4,492,118, Cl. 73-612.000.
Schwaab Inc.: *See*—
Nettesheim, Daniel R.; and Kufrin, Fred W., 4,492,162, Cl. 101-103.000.

Schwartz, Robert E.; and Keller, Michael R., to John Zink Company. Smokeless waste gas burning using low pressure staged steam. 4,492,558, Cl. 431-4.000.
Schwarz, Alois, to ID-Energiesysteme Gesellschaft m.b.H. Heat exchanger system. 4,492,093, Cl. 62-238.600.
Schweighardt, Frank K., to International Coal Refining Company. Automated apparatus for solvent separation of a coal liquefaction product stream. 4,492,674, Cl. 422-101.000.
Scondo, Christian: *See*—
Muller, Johannes; Kunst, Helmut; and Scondo, Christian, 4,492,604, Cl. 148-15.500.
Seaburg, Duane M.: *See*—
Insley, Gene L.; Seaburg, Duane M.; and Pearce, Daniel S., 4,493,069, Cl. 369-75.100.
Sears, Jerome: *See*—
Ficken, William; Sears, Jerome; and Parfomak, Walter, 4,492,902, Cl. 318-254.000.
Sears, Roebuck and Co.: *See*—
Gall, John C., 4,492,485, Cl. 400-697.100.
Secretary of State for Her Majesty's Government of the United Kingdom and Britain: *See*—
Chinn, Bryan P.; Armour, John S.; Watson, Peter M. F.; and Donne, Graham L., 4,492,244, Cl. 137-38.000.
Segesser, Bernhard: *See*—
Senn, Urs; and Segesser, Bernhard, 4,492,227, Cl. 128-165.000.
Seidenschnur, Ehrhardt: *See*—
Kebschull, Franz; and Seidenschnur, Ehrhardt, 4,492,861, Cl. 250-237.00G.
Selby, Donald W., to Square D Company. Watertight bushing and bolt mounting assembly. 4,492,817, Cl. 174-152.00R.
Sellstrom, Kathy B.: *See*—
McEntire, Edward E.; Sellstrom, Kathy B.; Nieh, Edward C. Y.; and Livingston, David R., 4,492,801, Cl. 564-135.000.
Senn & Co. AG: *See*—
Senn, Urs; and Segesser, Bernhard, 4,492,227, Cl. 128-165.000.
Senn, Urs; and Segesser, Bernhard, to Senn & Co. AG. Elastic knee bandage. 4,492,227, Cl. 128-165.000.
Shabushnig, John: *See*—
Hieftje, Gary M.; and Shabushnig, John, 4,492,322, Cl. 222-420.000.
Shannon, Paul J.: *See*—
Phan, Xuan T.; and Shannon, Paul J., 4,492,619, Cl. 204-158.00R.
Shapiro, Stanley: *See*—
Lee, Yung W.; Ling, Fu W.; and Shapiro, Stanley, 4,492,602, Cl. 148-11.50C.
Sharp Kabushiki Kaisha: *See*—
Hashimoto, Shintaro; Morimoto, Masafumi; Nakanishi, Tosaku; Yoshida, Hideo; and Yanagiuchi, Shigenobu, 4,493,050, Cl. 364-900.000.
Imaya, Akihiko; and Kitamura, Susumu, 4,492,433, Cl. 350-339.00R.
Sharp, Lewis A., Jr.: *See*—
Robinson, Thomas D.; Sharp, Lewis A., Jr.; and McAllister, George P., 4,491,990, Cl. 4-607.000.
Sheldrake, Leonard J., to General Motors Corporation. Motor vehicle battery rundown protection system. 4,493,001, Cl. 361-92.000.
Shell Oil Company: *See*—
Diaz, Zaida; and Miller, James H., 4,492,592, Cl. 62-18.000.
Diaz, Zaida, 4,492,593, Cl. 62-18.000.
Kamp, Anthony W., 4,492,276, Cl. 175-61.000.
Stewart, Thomas L.; and Demny, Florian C., 4,492,639, Cl. 210-746.000.
Shell, William E.; Burnam, Michael H.; and Tokes, Zoltan A., to Immudx, Inc. Method and means for assessment and prediction of risk of subsequent ischemic cardiac events. 4,492,753, Cl. 435-17.000.
Sherby, Oleg D.: *See*—
Ruano, Oscar; Wadsworth, Jeffrey; and Sherby, Oleg D., 4,492,671, Cl. 419-48.000.
Sherlock, Margaret H., to Schering Corporation. 1-Phenyl-1,8-naphthridin-2(1H)-ones. 4,492,702, Cl. 424-256.000.
Shibata, Norio, to Victor Company of Japan, Ltd. Turntable device having rotary recording medium size changeover capability in a rotary recording medium reproducing apparatus. 4,493,072, Cl. 369-271.000.
Shih, Arnold: *See*—
Haas, George A.; Shih, Arnold; and Marrian, Christie R. K., 4,492,866, Cl. 250-305.000.
Shima, Ichiji; Teshima, Hiroshi; Koizumi, Takayuki; and Usami, Teruo, to Mitsubishi Denki Kabushiki Kaisha; Shima, Ichiji; and Teshima, Hiroshi. Bearing failure judging apparatus. 4,493,042, Cl. 364-507.000.
Shimakawa, Yoshiaki: *See*—
Otabe, Norio; Shimakawa, Yoshiaki; and Uematsu, Hiroshi, 4,492,042, Cl. 34-35.000.
Shimamoto, Takeshi: *See*—
Arai, Kazuo; and Shimamoto, Takeshi, 4,492,581, Cl. 434-128.000.
Shimizu, Noriyuki: *See*—
Oishi, Naoaki; Shimizu, Noriyuki; Shoji, Takashi; and Harada, Shoji, 4,492,730, Cl. 428-328.000.
Shimojyo, Norio: *See*—
Goto, Tadahiko; Oniki, Kiyoshi; Murakami, Satoshi; Yokooji, Mitsunori; Andou, Norio; and Shimojyo, Norio, 4,492,906, Cl. 318-483.000.
Shimokawa, Ryushi: *See*—
Watanabe, Koji; Shiozawa, Kazuo; Suzuki, Kiziro; and Shimokawa, Ryushi, 4,492,450, Cl. 354-412.000.
Shimomura, Masaichi: *See*—
Masumoto, Hisayuki; and Shimomura, Masaichi, 4,492,437, Cl. 350-428.000.
Shimomura, Setsuhiro; and Kishimoto, Yuuji, to Mitsubishi Denki Kabushiki Kaisha. Air-to-fuel ratio control system for internal combustion engine. 4,492,211, Cl. 123-585.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; and Kobayashi, Taishi, 4,492,681, Cl. 423-345.000.
Shinkawa, Hiroyasu: *See*—
Aoki, Katsumichi; Kanda, Yoichi; Satake, Keigo; and Shinkawa, Hiroyasu, 4,492,597, Cl. 71-92.000.
Shinoda, Yuji: *See*—
Tsuchiya, Yutaka; Inuzuka, Eiji; and Shinoda, Yuji, 4,492,879, Cl. 307-248.000.
Shintaku, Yoshishige, to Ibuki Kogyo Co., Ltd. Horn speaker with reduced magnetic flux leakage. 4,492,827, Cl. 179-115.5SF.
Shionogi & Co., Ltd.: *See*—
Hirai, Kentaro, 4,492,794, Cl. 548-193.000.
Shiozawa, Kazuo: *See*—
Watanabe, Koji; Shiozawa, Kazuo; Suzuki, Kiziro; and Shimokawa, Ryushi, 4,492,450, Cl. 354-412.000.
Shirako, Hideo: *See*—
Saito, Shoichi; and Shirako, Hideo, 4,492,417, Cl. 312-9.000.
Shirasaki, Yuichi: *See*—
Izawa, Toshio; Iwamoto, Yoshinao; Shirasaki, Yuichi; and Asakawa, Kenichi, 4,492,492, Cl. 405-160.000.
Shirato, Yoshiaki: *See*—
Mitsuaki, Seki; Tazaki, Shigemitsu; and Shirato, Yoshiaki, 4,492,966, Cl. 346-33.00A.
Shoff, Daniel J.: *See*—
Chang, Richard S.; Ling, John Y.; and Shoff, Daniel J., 4,492,582, Cl. 434-169.000.
Shoher, Itzhak; and Whiteman, Aharon. Dental jacket crown, coping and method of construction. 4,492,579, Cl. 433-222.000.
Shoji, Takashi: *See*—
Oishi, Naoaki; Shimizu, Noriyuki; Shoji, Takashi; and Harada, Shoji, 4,492,730, Cl. 428-328.000.
Shore, David J., to Westinghouse Electric Corp. Thrust bearing starter apparatus. 4,492,481, Cl. 384-228.000.
Showa Denko Kabushiki Kaisha: *See*—
Oishi, Naoaki; Shimizu, Noriyuki; Shoji, Takashi; and Harada, Shoji, 4,492,730, Cl. 428-328.000.
Shtyrin, Anatoly S.: *See*—
Strekalou, Genrikhn; Shtyrin, Anatoly S.; Matveen, Viktor I.; Maryanchik, Mikhail A.; and Garibov, Genrikh S., 4,492,848, Cl. 219-127.000.
Shulman, Burt H.: *See*—
Masaki, Ichiro; Shulman, Burt H.; and Gorman, Robert R., 4,492,847, Cl. 219-124.340.
Sick, Peter; and Menini, Joseph, to Sick, Peter. Apparatus for filling bottles. 4,492,259, Cl. 141-198.000.
Siemens Aktiengesellschaft: *See*—
Geiger, Gerhard; and Strafner, Michael, 4,493,052, Cl. 364-900.000.
Kausche, Helmold; Moeller, Matthias; and Fischer, Franz, 4,492,813, Cl. 136-256.000.
Kersten, Ralf T.; Tietgen, Karl H.; and Schlaak, Helmut F., 4,492,425, Cl. 350-96.140.
Kopetzky, Horst, 4,492,821, Cl. 179-18.0FA.
Lange, Gerhard; and Boy, Jurgen, 4,493,004, Cl. 361-120.000.
Lange, Gerhard, 4,493,005, Cl. 361-124.000.
Lange, Gerhard; Boy, Jurgen; Hoene, Ernst-Ludwig; and Sippekamp, Oskar, 4,493,006, Cl. 361-124.000.
Lorenz, Dieter; and Olsen, Willi, 4,493,009, Cl. 361-341.000.
Mueller, Erwin, 4,492,942, Cl. 335-202.000.
Ramlohr, Franz; and Spitaler, Wolfgang, 4,493,015, Cl. 363-63.000.
Rathgeber, Max, 4,492,953, Cl. 340-347.0AD.
Schonwald, Siegfried, 4,492,530, Cl. 417-271.000.
Siemens-Allis, Inc.: *See*—
Luke, Roger D.; Ingram, Wayne A.; and Jarrell, Michael S., 4,492,396, Cl. 292-228.000.
Siemens Corporation: *See*—
Daniels, Stuart F., 4,493,078, Cl. 371-25.000.
Silverio, Vincent J., to AT&T Bell Laboratories. Memory write protection using timers. 4,493,031, Cl. 364-200.000.
Simovits, Stephen S., Jr., to American Plasticraft Company. Variable resistance assembly with improved contactor knob. 4,492,950, Cl. 338-162.000.
Singleton, Terence, to National Research Development Corporation. Orthopaedic traction apparatus. 4,492,224, Cl. 128-75.000.
Sintra-Alcatel: *See*—
Odero, Dominique; and Parent, Guy, 4,493,064, Cl. 367-92.000.
Sippekamp, Oskar: *See*—
Lange, Gerhard; Boy, Jurgen; Hoene, Ernst-Ludwig; and Sippekamp, Oskar, 4,493,006, Cl. 361-124.000.
Sitrick, David H., to Arrhythmia Research Technology, Inc. System and method for predicting ventricular tachycardia by derivative analysis. 4,492,235, Cl. 128-705.000.
Sjolund, John R., to Sundstrand Corporation. Nozzle and flapper with squeeze film damping. 4,492,245, Cl. 137-82.000.
SKF Industries, Inc.: *See*—
Baile, George H.; and Johnson, John J., 4,492,415, Cl. 384-463.000.
Skogen, Kermit J. Chimney cleaner. 4,492,000, Cl. 15-242.000.
SKW Trostberg Aktiengesellschaft: *See*—
Michaud, Horst; and von Seyerl, Joachim, 4,492,679, Cl. 423-268.000.

Sluyterman, Albertus A. S.; and Vink, Nicolaas G., to U.S. Philips Corporation. Device for displaying television pictures and deflection unit therefor. 4,492,943, Cl. 335-213.000.
Smeets, Louis M.: *See—*
Laarhoven, Johannes J.; van Dongeren, Jan P.; de Wit, Hendrik; and Smeets, Louis M., 4,492,867, Cl. 250-341.000.
Smetco, Inc.: *See—*
Smets, John E.; Smets, John S.; Smets, Robert D.; and Massinger, Barry K., 4,492,016, Cl. 29-432.000.
Smets, John E.; Smets, John S.; Smets, Robert D.; and Massinger, Barry K., to Smetco, Inc. Pallet assembly apparatus and method. 4,492,016, Cl. 29-432.000.
Smets, John S.: *See—*
Smets, John E.; Smets, John S.; Smets, Robert D.; and Massinger, Barry K., 4,492,016, Cl. 29-432.000.
Smets, Robert D.: *See—*
Smets, John E.; Smets, John S.; Smets, Robert D.; and Massinger, Barry K., 4,492,016, Cl. 29-432.000.
Smirnov, Boris A.: *See—*
Belykh, Sergei I.; Moschensky, Anatoly D.; Davydov, Anatoly B.; Pershin, Gely G.; Smirnov, Boris A.; and Gromov, Mikhail V., 4,492,226, Cl. 128-92.0BC.
Smit, Gerard C., to Smitdesign B.V. Float control for a switch. 4,492,834, Cl. 200-84.00R.
Smitdesign B.V.: *See—*
Smit, Gerard C., 4,492,834, Cl. 200-84.00R.
Smith, Donald P. Thermal treatment apparatus. 4,492,839, Cl. 219-10.55R.
Smith, Francis H., to Vickers Limited. Measuring microscope. 4,492,470, Cl. 356-372.000.
Smith, Harry D., Jr., to Halliburton Company. Determining elemental concentrations and formation matrix type from natural gamma ray spectral logs. 4,492,863, Cl. 250-256.000.
Smith, Harry D., Jr.; and Schultz, Ward E., to Texaco Inc. Neutron well logging. 4,492,864, Cl. 250-259.000.
Smith, John D.: *See—*
Yapp, Robert E.; and Smith, John D., 4,492,080, Cl. 60-388.000.
Smith, Roderick L., to Energy-Adaptive Grinding, Inc. Control system for grinding apparatus. 4,492,061, Cl. 51-325.000.
Smorol, Michael E.; Wituszynski, Michael C.; and Woollis, Theodore L., to Carrier Corporation. Combination refrigerant circuit and hot water preheater. 4,492,092, Cl. 62-181.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See—*
Kutz, Heinrich; Ostlinning, Gunter; and Jung, Gerd, 4,492,105, Cl. 72-302.000.
Snell, Richard G.; and Loughridge, Fredrick A., to GTE Products Corporation. Solder glass and electrical device employing same. 4,492,814, Cl. 174-50.640.
Snipes, Wallace: *See—*
Keith, Alec D.; and Snipes, Wallace, 4,492,685, Cl. 424-28.000.
Sobryco, Inc.: *See—*
Eriksen, Wilbur R.; and Payne, Harry E., Jr., 4,492,673, Cl. 422-85.000.
Societe Anonyme dite: L'Oreal: *See—*
Guillon, Michel; Mondet, Jean; Papantoniou, Christos; and Vandenbossche, Claudine, 4,492,686, Cl. 424-61.000.
Societe de Conseils de Recherches et d'Applications Scientifiques: *See—*
Esanu, Andre , 4,492,701, Cl. 424-251.000.
Societe Nationale Industrielle Aerospatiale: *See—*
Cahuzac, Georges J. J., 4,492,096, Cl. 66-11.000.
Societe Normande de Recherches et de Participation: *See—*
Prevel, Pierre, 4,492,585, Cl. 8-493.000.
Societe Spart: *See—*
Chiotasso, Pierre; and Dostes, Jacques, 4,492,183, Cl. 119-51.130.
Soda Aoromatic Company, Limited: *See—*
Matsumoto, Yuuichi; Kawasaki, Kiyomitsu; and Ishitani, Masato, 4,492,644, Cl. 252-522.00A.
Sofianek, Joseph C.: *See—*
Crosch, Donald W.; and Sofianek, Joseph C., 4,492,837, Cl. 200-144.00B.
Sojka, Bernward: *See—*
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Solarex Corporation: *See—*
Lindmayer, Joseph, 4,492,812, Cl. 136-256.000.
Solomon, Robert A., to Am Fab, Inc. Locking mechanism for vertically adjustable table. 4,492,170, Cl. 108-148.000.
Solvi, Marc: *See—*
Burton, Clement; Kremer, Andre; Stomp, Hubert; and Solvi, Marc, 4,492,342, Cl. 241-67.000.
Sommer, Karl; and Armbrecht, Norbert, to Hoechst Aktiengesellschaft. Water-soluble trisazo dyestuffs on the basis of a combination of naphthalene-, diphenylamine- and pyrazolone derivatives. 4,492,653, Cl. 534-796.000.
Sonoco Products Company: *See—*
Collins, Thomas D., 4,492,332, Cl. 229-15.000.
Sony Corporation: *See—*
Eguchi, Yasuhito; and Kariya, Izumi, 4,492,482, Cl. 400-120.000.
Kono, Takashi; Minegishi, Akira; and Kamai, Toshimitsu, 4,492,986, Cl. 358-330.000.
Mori, Yoshihisa; Kobayashi, Hachisaro; and Takashima, Mitsuru, 4,493,071, Cl. 369-146.000.
Ohkubo, Hiroyuki, 4,492,922, Cl. 324-207.000.
Watanabe, Nobuhiko; and Tanaka, Masato, 4,492,989, Cl. 360-32.000.
Sovonics Solar Systems: *See—*
Ovshinsky, Herbert C.; and Izu, Masatsugu, 4,492,181, Cl. 118-718.000.
Ovshinsky, Stanford R.; and Izu, Masatsugu, 4,492,810, Cl. 136-255.000.
Spademan, Richard G. Step-in side-clamp safety ski release system. 4,492,387, Cl. 280-624.000.
Sparano, Ottorino: *See—*
Marelli, Ernesto, 4,492,338, Cl. 239-102.000.
Spear, Woodrow. Overlay code selection system. 4,492,487, Cl. 402-79.000.
Specht, Theodore R.: *See—*
Cham, Edward J.; and Specht, Theodore R., 4,493,016, Cl. 363-126.000.
Specht, Victor J. Variable displacement gerotor pump. 4,492,539, Cl. 418-19.000.
Speckhart, Frank H. Infant health monitoring system. 4,492,279, Cl. 177-45.000.
Spector, Donald. Aroma disc for table lamp. 4,493,011, Cl. 362-96.000.
Spencer, John E.; Greene, Reginald S.; and Fisher, Terrence L., to Eastman Kodak Company. Camera mechanism. 4,492,443, Cl. 354-121.000.
Speno International S.A.: *See—*
Panetti, Romolo, 4,492,059, Cl. 51-178.000.
Spetsialnoe Konstruktorsko-Tekhnologicheskoe Bjuro "Energostalproekt": *See—*
Strekalou, Genrikhn; Shtyrin, Anatoly S.; Matveen, Viktor I.; Maryanchik, Mikhail A.; and Garibov, Genrikh S., 4,492,848, Cl. 219-127.000.
Spitaler, Wolfgang: *See—*
Ramlohr, Franz; and Spitaler, Wolfgang, 4,493,015, Cl. 363-63.000.
Spitzer, Wayne A., to Eli Lilly and Company. Antiviral benzimidazoles. 4,492,708, Cl. 424-273.00B.
Spliethoff, Heinz, to Saarbergwerke Aktiengesellschaft. Method for supplying remote heating circuits with heat from a thermal power plant. 4,492,084, Cl. 60-648.000.
Sprecker, Mark A.; Klemarczyk, Philip T.; and Belko, Robert P., to International Flavors & Fragrances Inc. Organoleptic use of cyclohexenyl-alpha-alkyl acrolein derivatives. 4,492,645, Cl. 252-522.00R.
Square D Company: *See—*
Selby, Donald W., 4,492,817, Cl. 174-152.00R.
Staats, Jean B. C. H.; and Declerck, Gabriel D., to U.S. Philips Corporation. Resistor having a positive temperature coefficient. 4,492,947, Cl. 338-22.00R.
Staerzl, Richard E., to Brunswick Corporation. Electrode apparatus for cathodic protection. 4,492,877, Cl. 307-95.000.
Stahl, Charles R.; and Perugi, Archie H., to General Electric Company. Gas turbine power plant. 4,492,085, Cl. 60-649.000.
Stahl, Ulf: *See—*
Esser, Karl; Stahl, Ulf; Tudzynski, Paul; and Kuck, Ulrich, 4,492,758, Cl. 435-317.000.
Stahlkopf, Friedrich R. R., to Otto Tuchenhagen GmbH & Co. KG. Diaphragm pump. 4,492,535, Cl. 417-394.000.
Stamboulian, Nazareth, to American Safety Equipment Corporation. Programmed pawl control means. 4,492,349, Cl. 242-107.40A.
Standard Oil Company (Indiana): *See—*
Howe, Arthur T., 4,492,743, Cl. 429-111.000.
Michel, Frederick A., 4,492,562, Cl. 431-177.000.
Stang Hydronics Inc.: *See—*
Dron, James B., 4,492,514, Cl. 415-1.000.
Stanley, Donald O.: *See—*
Collmeyer, Arthur J.; Hoel, Jeffrey H.; King, Paul F.; Stanley, Donald O.; and Sturgeon, Roger, 4,492,956, Cl. 340-723.000.
Star Industries, Inc.: *See—*
Haines, Robert E., 4,492,391, Cl. 285-114.000.
Stauffer Chemical Company: *See—*
Giolito, Silvio L., 4,492,660, Cl. 260-966.000.
Steel Heddle Manufacturing Company: *See—*
Kramer, Charles F., 4,492,256, Cl. 139-92.000.
Steggles, David J.: *See—*
Chakrabarti, Jiban K.; Hotten, Terrence M.; and Steggles, David J., 4,492,699, Cl. 424-250.000.
Steinbrenner, Ulrich: *See—*
Bertsch, Richard; Gunther, Dieter; and Steinbrenner, Ulrich, 4,492,204, Cl. 123-489.000.
Steiner, Alois, to Sulzer-Ruti Machinery Works Limited. Apparatus for guiding a fluid medium driven weft thread in the shed of a weaving machine and use of the apparatus at a multiple longitudinal traversing shed weaving machine. 4,492,254, Cl. 139-11.000.
Steiner, Alois, to Sulzer-Ruti Machinery Works Limited. Apparatus for guiding a fluid medium driven weft thread in the shed of a weaving machine and use of the apparatus at a multiple longitudinal traversing shed weaving machine. 4,492,255, Cl. 139-11.000.
Steiner, Hermann; and Schonherr, Walter, to Patent-Treuhand Gesellschaft fur elektrische Gluhlampen GmbH. Dual filament halogen cycle automotive-type incandescent lamp. 4,492,893, Cl. 313-318.000.
Steins, Wilfried: *See—*
Weishaupt, Walter; and Steins, Wilfried, 4,493,102, Cl. 381-2.000.
Stepneski, David A.: *See—*
Fryer, George B.; and Stepneski, David A., 4,493,108, Cl. 382-61.000.
Steppan, Hartmut: *See—*
Lutz, Walter; Steppan, Hartmut; and Erdmann, Fritz, 4,492,748, Cl. 430-175.000.

Stevens, John L.: *See*—
Harrington, Kent W.; Stevens, John L.; and Thorpe, Merle L., 4,492,337, Cl. 239-81.000.
Stewart, David G.: *See*—
Ball, William J.; Cotton, Leonard; and Stewart, David G., 4,492,772, Cl. 518-713.000.
Ball, William J.; Cotton, Leonard; and Stewart, David G., 4,492,773, Cl. 518-713.000.
Stewart, Thomas L.; and Demny, Florian C., to Shell Oil Company. Leak detection. 4,492,639, Cl. 210-746.000.
Sticht, Walter. Assembly line arrangement. 4,492,297, Cl. 198-345.000.
Stigebrandt, Ake. Device for separating solid substances from liquids. 4,492,635, Cl. 210-519.000.
Stockburger, Hermann; and Winderlich, Hans-Georg. Method and device for identifying data supports. 4,493,107, Cl. 382-58.000.
Stockle, Bernd; and Pfendler, Klaus, to International Standard Electric Corporation. Apparatus for synchronizing the slats of motor driven window blinds. 4,492,908, Cl. 318-663.000.
Stoltefuss, Jurgen: *See*—
Goldmann, Siegfried; Boshagen, Horst; Stoltefuss, Jurgen; Schramm, Matthias; Thomas, Gunter; and Kazda, Stanislav, 4,492,703, Cl. 424-266.000.
Stomp, Hubert: *See*—
Burton, Clement; Kremer, Andre; Stomp, Hubert; and Solvi, Marc, 4,492,342, Cl. 241-67.000.
Stone & Webster Engineering Corp.: *See*—
Johnson, Axel R.; Narayanan, Swami; and Woebcke, Herman N., 4,492,624, Cl. 208-78.000.
Storm, Linda W., to Babies by Storm, Inc. Sling-type infant carrier. 4,492,326, Cl. 224-160.000.
Storni, Angelo: *See*—
Blattner, Hans; and Storni, Angelo, 4,492,691, Cl. 424-244.000.
Strafner, Michael: *See*—
Geiger, Gerhard; and Strafner, Michael, 4,493,052, Cl. 364-900.000.
Strekalou, Genrikha; Shtyrin, Anatoly S.; Matveen, Viktor I.; Maryanchik, Mikhail A.; and Garibov, Genrikh S., to Spetsialnoe Konstruktorsko-Tekhnologicheskoe Bjuro "Energostalproekt". Spot arc welding apparatus. 4,492,848, Cl. 219-127.000.
Stroupe, Stephen D.: *See*—
Wang, Chao-Huei J.; Stroupe, Stephen D.; and Jolley, Michael E., 4,492,762, Cl. 436-537.000.
Struthers, Ralph C. Boron monoxide-hydrogen peroxide fuel cell. 4,492,741, Cl. 429-34.000.
Stuart, Robert A., to Rotaflex plc. Electrical supply systems. 4,492,420, Cl. 339-22.00R.
Stubb, Paul R. Method and apparatus for electrodeposition of materials. 4,492,621, Cl. 204-261.000.
Stuchlik, Terry L.: *See*—
Bankar, Vilas G.; Stuchlik, Terry L.; and Werny, Frank, 4,492,731, Cl. 428-362.000.
Stull, Keefer S., Jr.: *See*—
Jensen, Arthur S.; and Stull, Keefer S., Jr., 4,492,882, Cl. 307-497.000.
Stupak, Rimma I.: *See*—
Kljuchko, Gennady V.; Padalka, Valentin G.; Sablev, Leonid P.; and Stupak, Rimma I., 4,492,845, Cl. 219-121.00P.
Sturgeon, Roger: *See*—
Collmeyer, Arthur J.; Hoel, Jeffrey H.; King, Paul F.; Stanley, Donald O.; and Sturgeon, Roger, 4,492,956, Cl. 340-723.000.
Suda, Kenichi; Tamaki, Katsuyuki; Tateishi, Kazushi; and Abe, Kohichiroh, to Tokyo Shibaura Denki Kabushiki Kaisha; and Teac Corp. Video tape recorder. 4,492,994, Cl. 360-85.000.
Sugimoto, Yasuhiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Voltage controlled oscillator with linear charscteristic. 4,492,934, Cl. 331-117.00R.
Sugitani, Masami, to Murata Manufacturing Co., Ltd. Noise elimninator. 4,493,007, Cl. 361-307.000.
Suglia, Jean-Claude: *See*—
Herve, Jean-Jacques; Suglia, Jean-Claude; and Meinard, Colette, 4,492,687, Cl. 424-174.000.
Sulzer-Ruti Machinery Works Limited: *See*—
Steiner, Alois, 4,492,254, Cl. 139-11.000.
Steiner, Alois, 4,492,255, Cl. 139-11.000.
Sumitomo Electric Industries, Ltd.: *See*—
Hara, Akio; Miyake, Masaya; and Yazu, Shuji, 4,492,846, Cl. 219-121.0LC.
Moriya, Michio, 4,492,411, Cl. 303-6.00C.
Sunago, Katsuyoshi; and Iwamoto, Tomio, 4,492,230, Cl. 128-303.100.
Sumitomo, Hiroyuki: *See*—
Uehara, Haruo; and Sumitomo, Hiroyuki, 4,492,268, Cl. 165-166.000.
Sun, Anthony M. F.: *See*—
Goosen, Mattheus F. A.; and Sun, Anthony M. F., 4,492,684, Cl. 424-19.000.
Sun, Franklin K.: *See*—
Lewis, George K.; Sun, Franklin K.; Keene, Douglas L.; and Fidel, Howard F., 4,492,120, Cl. 73-625.000.
Sunago, Katsuyoshi; and Iwamoto, Tomio, to Sumitomo Electric Industries, Ltd. Extension mechanism of adaptor for laser scalpel. 4,492,230, Cl. 128-303.100.
Sund, Lloyd P. Pickup roller spreader. 4,492,074, Cl. 56-364.000.
Sundberg, Hardy. Gas combustion control apparatus. 4,492,560, Cl. 431-12.000.
Sundstrand Corporation: *See*—
Baldwin, Jeffrey D., 4,492,887, Cl. 310-68.00R.
Sjolund, John R., 4,492,245, Cl. 137-82.000.
Susor, Rita M., executor: *See*—
Susor, William C., deceased, 4,492,280, Cl. 177-211.000.
Susor, William C., deceased (by Susor, Rita M., executor), to Maastron Scale Inc. Weighing apparatus including load cells with intrinsic safety barrier. 4,492,280, Cl. 177-211.000.
Susumu Ubukata: *See*—
Ubukata, Susumu; and Mizutani, Yasukazu, 4,493,066, Cl. 367-178.000.
Suurkuusk, Jaak: *See*—
Wadso, Ingemar; Suurkuusk, Jaak; and Taylor, Robert L., 4,492,480, Cl. 374-33.000.
Suzuki, Atsushi; Yamada, Hiromichi; Uchida, Yoko; Kohno, Hideki; and Yoshida, Minoru, to Hitachi Medical Corporation. Radiation detector. 4,492,869, Cl. 250-367.000.
Suzuki, Kenji: *See*—
Kanai, Tamaki; Yoshikawa, Hirofumi; Yamagishi, Takashi; Suzuki, Kenji; and Ohta, Yoshikatsu, 4,492,719, Cl. 427-171.000.
Suzuki, Kiziro: *See*—
Watanabe, Koji; Shiozawa, Kazuo; Suzuki, Kiziro; and Shimokawa, Ryushi, 4,492,450, Cl. 354-412.000.
Suzuki, Norihito: *See*—
Yamamoto, Takeshi; Suzuki, Norihito; Aoki, Toru; and Iwaki, Akio, 4,492,740, Cl. 428-629.000.
Suzuki, Shinichi; Sasaki, Masayuki; Moriyasu, Toshinori; and Arakawa, Takao, to Tokyo Shibaura Denki Kabushiki Kaisha. Picture blur-alarm device for a camera. 4,492,452, Cl. 354-430.000.
Suzuki, Takeshi; Murao, Mikio; Uchida, Masahiro; Kumagai, Chikanori; and Yotsui, Yasuhiko, to Kawasaki Jukogyo Kabushiki Kaisha. Calcining system provided with a planetary cooler. 4,492,570, Cl. 432-106.000.
Suzuki, Tutomu: *See*—
Oya, Akiyoshi; Nakada, Akira; and Suzuki, Tutomu, 4,492,142, Cl. 84-1.030.
Suzuki, Yasuhiko: *See*—
Yamanaka, Teruo; Hayakawa, Kizo; Suzuki, Yasuhiko; and Esaki, Michiru, 4,492,114, Cl. 73-117.300.
Suzuki, Yasuro: *See*—
Asano, Etuo; Suzuki, Yasuro; and Midou, Nobuo, 4,492,884, Cl. 310-45.000.
Svens, Runar, to AB Nordstroms Linbanor. Feeding device for a vertical tube conveyor. 4,492,302, Cl. 198-671.000.
Sviniin, Mikhail P.: *See*—
Dmitriev, Stanislav P.; Ivanov, Andrei S.; Sviniin, Mikhail P.; and Fedotov, Mikhail T., 4,492,873, Cl. 250-492.300.
Swain, James C.; and Thomas, David L., to Diesel Kiki Co., Ltd. (Japanese Corp.). Wobble plate piston pump. 4,492,527, Cl. 417-222.000.
Swartz, Robert G.: *See*—
Finegan, Sean N.; McFee, James H.; and Swartz, Robert G., 4,492,852, Cl. 219-405.000.
Swedish Institute for Silicate Research: *See*—
Pompe, Robert, 4,492,665, Cl. 264-65.000.
Swisher, James A. Key for a lock of the plunger operated type. 4,492,100, Cl. 70-34.000.
Swiss Aluminium Ltd.: *See*—
Mizrah, Tiberiu; Hoffmann, Matthias; Kaser, Peter; and Heilig, Klemens, 4,492,670, Cl. 419-9.000.
Switzer, Jay A., to Union Oil Company of California. Heterojunction photovoltaic device. 4,492,811, Cl. 136-255.000.
Switzer, Robert D. Modular cartridge loading board system. 4,492,051, Cl. 42-87.000.
Sword, Edward L., Jr. Web position indicator. 4,493,065, Cl. 367-96.000.
Syntex (U.S.A.) Inc.: *See*—
Broadhead, James H., 4,492,407, Cl. 297-78.000.
Synthelabo: *See*—
Kaplan, Jean-Pierre; George, Pascal; and Bernardon, Jean-Michel, 4,492,695, Cl. 424-246.000.
Purcell, Thomas A., 4,492,709, Cl. 424-273.00R.
Szabo, Steven B.: *See*—
Wells, Calvin G.; and Szabo, Steven B., 4,492,019, Cl. 29-447.000.
Szekely, Tamas; Csanda, Ferenc; Nagy, Gabor; and Czerny, Gyozo, to Magyar Tudomanyos Akademia Termeszettudomanyi Kutato Laboratorium, /a/ nyi Kutat Laboratrium 03; and Foldmero es Talajvizgalo Vallalat. Process for stabilizing aqueous solutions used in the preparation of hydrophilic polymeric gelscu4,492,49E,a, Cl. 405-264.000.
Szmuilowicz, Yehuda I.: *See*—
Ray, Valton O.; Roeland, Robert H.; Potter, Carl H.; and Szmuilowicz, Yehuda I., 4,492,557, Cl. 425-72.00S.
T.A.D. Avanti, Inc.: *See*—
Martinez, Arthur T.; and Kilstofte, Richard B., 4,492,828, Cl. 200-5.00R.
Tada, Hiroshi: *See*—
Ito, Yasuro; Higuchi, Yoshiro; Tsuji, Masanori; Yamamoto, Yasuhiro; Tada, Hiroshi; Kuroha, Kenji; Nakamura, Takashi; and Tomikawa, Koichi, 4,492,478, Cl. 366-28.000.
Tada, Tetsuya, to Canyon Corporation. Dispenser with an air pump mechanismcu4,492,320, Cl. 222-398.000.
TAFA Incorporated: *See*—
Harrington, Kent W.; Stevens, John L.; and Thorpe, Merle L., 4,492,337, Cl. 239-81.000.

Taisei Corporation: *See*—
Ito, Yasuro; Higuchi, Yoshiro; Tsuji, Masanori; Yamamoto, Yasuhiro; Tada, Hiroshi; Kuroha, Kenji; Nakamura, Takashi; and Tomikawa, Koichi, 4,492,478, Cl. 366-28.000.

Taito Kabushiki Kaisha: *See*—
Nakasone, Seiken; Miyagi, Sadao; Aragaki, Takehiko; and Higa, Yasusi, 4,492,601, Cl. 127-48.000.

Tajima, Michio, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for determining impurities in epitaxial silicon crystalscu4,492,871, Cl. 250-459.100.

Takagi, Shigeru; and Hayashi, Nobutoshi, to Nippon Sokea, Inc. Method and apparatus for detecting degree of clogging in particle trapping member of internal combustion engineco4,492,079, Cl. 60-274.000.

Takahashi, Ikuo, to Hitachi, Ltd. Fuel pumping apparatuscu4,492,200, Cl. 123-450.000.

Takahashi, Seigo: *See*—
Nishina, Shingo; Takahashi, Seigo; and Ohtani, Shigeru, 4,492,034, Cl. 33-170.000.

Takahashi, Toru; and Ueno, Takashi, to Nissan Motor Company, Limited. Method of feedback controlling engine idle speedcu4,492,195, Cl. 123-339.000.

Takahashi, Toshio, to Eisai Co., Ltd. Method of detecting foreign matters mixed in a liquid contained in transparent receptacles and apparatus relevant theretocu4,492,475, Cl. 356-427.000.

Takamizawa, Minoru: *See*—
Endou, Morinobu; Takamizawa, Minoru; Hongu, Tatsuhiko; and Kobayashi, Taishi, 4,492,681, Cl. 423-345.000.

Takano, Kazukiyo; and Koga, Keigi, to Hitachi, Ltd. Retail terminalcu4,493,037, Cl. 364-405.000.

Takashima, Mitsuru: *See*—
Mori, Yoshihisa; Kobayashi, Hachisiro; and Takashima, Mitsuru, 4,493,071, Cl. 369-146.000.

Takashima, Ryokichi; Goko, Nobuaki; Uehara, Yumito; Nishihara, Yasuhiro; and Yamamoto, Hidetoshi, to Mitsubishi Chemical Industries Limited. Process for continuously producing propylene-ethylene block copolymercu4,492,787, Cl. 525-53.000.

Takata, Manabu; Inoue, Shojiro; and Mori, Keiichi, to Matsushita Electric Industrial Co., Ltd. Cooker with heating control systemcu4,492,336, Cl. 236-20.00A.

Takei, Toshihiro: *See*—
Watanabe, Kiyohiko; Matsui, Kazuma; Hattori, Yoshiyuki; Takei, Toshihiro; Nakamura, Toshiaki; and Ohnishi, Shunsaku, 4,492,515, Cl. 415-53.00T.

Taketoshi, Kazuhisa; and Ogusu, Chihaya, to Nippon Hoso Kyokai. TV Camera tubecu4,492,981, Cl. 358-217.000.

Takeuchi, Eiji. Saber saw bladecu4,492,141, Cl. 83-852.000.

Takimoto, Hiroyuki; Kuniyoshi, Takashi; and Ushiro, Tatsuzo, to Canon Kabushiki Kaisha. Video camera image tube burn-in prevention apparatuscu4,492,982, Cl. 358-228.000.

Talke, Frank E.: *See*—
Lee, Francis C.; Mills, Ross N.; Niweigha, Tiefa K.; and Talke, Frank E., 4,492,968, Cl. 346-140.00R.

Tamai, Yasuo: *See*—
Ogawa, Hiroshi; and Tamai, Yasuo, 4,492,734, Cl. 428-424.200.
Ogawa, Hiroshi; and Tamai, Yasuo, 4,492,735, Cl. 428-424.200.

Tamaki, Katsuyuki: *See*—
Suda, Kenichi; Tamaki, Katsuyuki; Tateishi, Kazushi; and Abe, Kohichiroh, 4,492,994, Cl. 360-85.000.

Tamate, Masazi: *See*—
Kubota, Toru; Tamate, Masazi; and Sauzu, Masaaki, 4,492,955, Cl. 340-636.000.

Tanaka, Akira: *See*—
Ziv, Avraham; and Tanaka, Akira, 4,492,348, Cl. 242-107.200.

Tanaka, Atsuo: *See*—
Donomoto, Tadashi; and Tanaka, Atsuo, 4,492,265, Cl. 164-493.000.

Tanaka, Masato: *See*—
Watanabe, Nobuhiko; and Tanaka, Masato, 4,492,989, Cl. 360-32.000.

Tanaka, Minoru: *See*—
Haneda, Satoshi; Itaya, Masahiko; and Tanaka, Minoru, 4,492,456, Cl. 355-3.0DD.

Tanaka, Osamu; Watanabe, Noboru; and Iiyama, Hiroshi, to Jeco Company Limited. Inclinometercu4,492,029, Cl. 33-366.000.

Tanaka, Shigeo: *See*—
Nakashima, Kazuhide; Saito, Takayuki; Nakahara, Takeshi; and Tanaka, Shigeo, 4,492,789, Cl. 525-531.000.

Tanaka, Shuji: *See*—
Fujii, Kozo; Nishihira, Keigo; Sawada, Hircyuki; Tanaka, Shuji; Nakai, Mamoru; Yoshida, Hiroshi; and Inoue, Teruhiko, 4,492,792, Cl. 544-326.000.

Tanaka, Taku; Maruyama, Hitoshi; Okaya, Takuji; and Kajitani, Koichi, to Kuraray Co., Ltd. Binder for obtaining a ceramic molded green bodycu4,492,783, Cl. 524-430.000.

Tanaka, Yoshiaki: *See*—
Inami, Mamoru; Tanaka, Yoshiaki; and Ohtsuki, Zenju, 4,492,917, Cl. 324-77.00A.

Tanaka, Yoshiyuki, to Nissan Motor Company, Limited. Lock cylinder attaching device for vehicle movable closure lockscu4,492,101, Cl. 70-370.000.

Tang, Robert H., to PPG Industries, Inc. Dicyanomethyl ethyl peroxy dicarbonate polymerization initiatorscu4,492,656, Cl. 260-453.0RZ.

Tani, Kenroku: *See*—
Hayakawa, Daishiro; Akimoto, Masao; Narita, Katsumi; and Tani, Kenroku, 4,492,928, Cl. 330-126.000.

Taniguchi, Motoya; Ikeda, Minoru; and Komeyama, Yoshihiro, to Hitachi, Ltd. Precision parallel translation systemcu4,492,356, Cl. 248-346.000.

Tanii, Shigetaka; and Sasaki, Hisao, to Toyama Machine Works, Ltd. Robot hand driving mechanismcu4,492,510, Cl. 414-733.000.

Tanner, David P., to Atlantic Richfield Company. Process for forming microcrystalline silicon material and productcu4,492,736, Cl. 428-446.000.

Tao, Luh C.; and Blease, James W., to University of Nebraska, The Board of Regents of the. Water separation processcu4,492,637, Cl. 210-711.000.

Tateishi, Kazushi: *See*—
Suda, Kenichi; Tamaki, Katsuyuki; Tateishi, Kazushi; and Abe, Kohichiroh, 4,492,994, Cl. 360-85.000.

Taylor, Eric, to Paterson Product Ltd. Apparatus for developing photographic materialcu4,492,447, Cl. 354-312.000.

Taylor, Glenn N., to Neomed, Incorporated. Hand-controllable switching device for electrosurgical instrumentscu4,492,832, Cl. 200-52.00R.

Taylor, Robert L.: *See*—
Wadso, Ingemar; Suurkuusk, Jaak; and Taylor, Robert L., 4,492,480, Cl. 374-33.000.

Tazaki, Shigemitsu: *See*—
Mitsuaki, Seki; Tazaki, Shigemitsu; and Shirato, Yoshiaki, 4,492,966, Cl. 346-33.00A.

Teac Corp.: *See*—
Suda, Kenichi; Tamaki, Katsuyuki; Tateishi, Kazushi; and Abe, Kohichiroh, 4,492,994, Cl. 360-85.000.

Teater, Albert: *See*—
James, Miranda L.; and Teater, Albert, 4,492,823, Cl. 179-81.00R.

Technicare Corporation: *See*—
Dulapa, Mark J.; and Glenn, William M., Jr., 4,492,119, Cl. 73-621.000.
Guess, Joe F.; and Pearce, Thomas, 4,492,317, Cl. 222-39.000.

Teijin, Limited: *See*—
Kanai, Tamaki; Yoshikawa, Hirofumi; Yamagishi, Takashi; Suzuki, Kenji; and Ohta, Yoshikatsu, 4,492,719, Cl. 427-171.000.

Tektronix: *See*—
Hoeren Gerd H.; and Palmquist, Steven R., 4,493,044, Cl. 364-579.000.

Teldix GmbH: *See*—
Auer, Werner, 4,492,131, Cl. 74-574.000.

Temper-Ring Equipment Corporation: *See*—
Rode, John E., 4,492,018, Cl. 29-437.000.

Temple, Michael D.: *See*—
Mayer, Thomas; Temple, Michael D.; Boling, Norman L.; and Rancourt, James D., 4,492,718, Cl. 427-160.000.

Tenneco, Inc.: *See*—
McCoy, James J., Jr., 4,492,516, Cl. 415-53.00T.

Terasawa, Koji, to Canon Kabushiki Kaisha. Capping device for a multi-ink jet headcu4,492,969, Cl. 346-140.00R.

Terauchi, Kiyoshi: *See*—
Iimori, Takayuki; Terauchi, Kiyoshi; and Sakamoto, Seiichi, 4,492,543, Cl. 418-55.000.

Terra Technology Corp.: *See*—
Hernandez, E. Norman; and Hammerquist, Eric M., 4,492,918, Cl. 324-83.00R.

Terry, John F., Jr.: *See*—
Christine, David R.; and Terry, John F., Jr., 4,492,490, Cl. 404-108.000.

Teshima, Hiroshi: *See*—
Shima, Ichiji; Teshima, Hiroshi; Koizumi, Takayuki; and Usami, Teruo, 4,493,042, Cl. 364-507.000.

Teske, Lothar. Bulk-storage apparatus with unloadercu4,492,508, Cl. 414-304.000.

Texaco Inc.: *See*—
McEntire, Edward E.; Sellstrom, Kathy B.; Nieh, Edward C. Y.; and Livingston, David R., 4,492,801, Cl. 564-135.000.
Smith, Harry D., Jr.; and Schultz, Ward E., 4,492,864, Cl. 250-259.000.

Texas Instruments Incorporated: *See*—
McElroy, David J., 4,493,057, Cl. 365-182.000.
Trotta, Patrick A.; and Zak, Paul A., 4,492,763, Cl. 501-40.000.

Texas Oil Spill Control, Inc.: *See*—
Rymal, Theodore R., Jr., 4,492,630, Cl. 210-117.000.

Textron Inc.: *See*—
Bieschke, Martin, 4,492,422, Cl. 339-95.00R.

Thaler, Arnold; Friedson, David; and Kin, Lai, to Windmere Corporation. Retractable curling brushcu4,492,241, Cl. 132-37.00R.

Theriault, Gerald E., to RCA Corporation. Terminated switchcu4,492,937, Cl. 333-103.000.

Therm-O-Disc, Incorporated: *See*—
Loescher, Michael R., 4,492,946, Cl. 337-365.000.

Thierbach, Mark E., to AT&T Bell Laboratories. Microprocessor with PLA adapted to implement subroutinescu4,493,029, Cl. 364-200.000.

Thiokol Corporation: *See*—
Junior, Kenneth E.; and Byrd, James D., 4,492,779, Cl. 523-138.000.

Thomas, Bobby J.; and Heath, Billy J., to Conoco Inc. Seismic vibrator control systemcu4,493,067, Cl. 367-189.000.

Thomas, David L.: *See*—
Swain, James C.; and Thomas, David L., 4,492,527, Cl. 417-222.000.

Thomas, Gunter: *See*—
Goldmann, Siegfried; Boshagen, Horst; Stoltefuss, Jurgen; Schramm, Matthias; Thomas, Gunter; and Kazda, Stanislav, 4,492,703, Cl. 424-266.000.

Thomas, Leslie D., to Westinghouse Electric Corp. Transmission system for TV signalscu4,492,978, Cl. 358-134.000.
Thomas, Paul M.; and Abrahamson, Daniel P., to Builders Equipment Company. High speed pushercu4,492,503, Cl. 414-152.000.
Thompson, Dennis J., to AT&T Bell Laboratories. Multi-device apparatus synchronized to the slowest devicecu4,493,053, Cl. 364-900.000.
Thomson-CSF: *See*—
Albarello, Alain; Roullet, Andre; and Pimentel, Alberto, 4,492,936, Cl. 332-19.000.
de Chambost, Emmanuel; and Trotel, Jacques, 4,492,870, Cl. 250-398.000.
Ganem, Herve, 4,493,111, Cl. 455-79.000.
Huignard, Jean-Pierre; Herriau, Jean-Pierre; and Marrakchi El Fellah, Abdellatif, 4,492,468, Cl. 356-347.000.
Thomson-CSF Telephone: *See*—
Nicolas, Alain; and Chapelain, Jean-Pierre, 4,493,022, Cl. 364-200.000.
Thomson, David J., to AT&T Bell Laboratories. Clock phase control with time distribution of phase correctionscu4,493,094, Cl. 375-119.000.
Thor, Charles C. Coupling system for power take-off shaftscu4,492,292, Cl. 192-67.00R.
Thorpe, Merle L.: *See*—
Harrington, Kent W.; Stevens, John L.; and Thorpe, Merle L., 4,492,337, Cl. 239-81.000.
Thorsen, Thomas A.: *See*—
Greenwood, Leon D.; and Thorsen, Thomas A., 4,492,190, Cl. 123-185.00A.
Thuasne-Paris: *See*—
Picolet, Jean-Pierre; Rudloff, Jean-Loup; and Courtet, Francois, 4,492,225, Cl. 128-87.00R.
Tietgen, Karl H.: *See*—
Kersten, Ralf T.; Tietgen, Karl H.; and Schlaak, Helmut F., 4,492,425, Cl. 350-96.140.
Till, Henry R.: *See*—
Folkins, Jeffrey J.; Haque, Shahid; Loeb, Alfred M.; and Till, Henry R., 4,492,179, Cl. 118-689.000.
Tilley, Alec R.: *See*—
Wright, Michael L.; and Tilley, Alec R., 4,492,021, Cl. 29-623.100.
Tims, Harold A.; Elliott, Sheldon E.; Montgomery, Orin C.; and Doggett, William N., to Phillips Petroleum Company. Method and apparatus for seismic geophysical explorationcu4,493,063, Cl. 367-77.000.
Timtner, Karlheinz: *See*—
Weiler, Rolf; Boehm, Peter; Haar, Lucas H.; and Timtner, Karlheinz, 4,492,081, Cl. 60-547.100.
Toba, Yasuo, to Mitsubishi Denki Kabushiki Kaisha. Transformer windingcu4,492,944, Cl. 336-69.000.
Toda, Akira: *See*—
Ogawa, Naoki; and Toda, Akira, 4,492,189, Cl. 123-90.380.
Toda, Akitoshi: *See*—
Mimura, Yoshiyuki; Okada, Takao; and Toda, Akitoshi, 4,492,745, Cl. 430-67.000.
Tokes, Zoltan A.: *See*—
Shell, William E.; Burnam, Michael H.; and Tokes, Zoltan A., 4,492,753, Cl. 435-17.000.
Tokico Ltd.: *See*—
Tsuge, Kazuo, 4,492,533, Cl. 417-372.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Fujimori, Yasutomo, 4,492,469, Cl. 356-361.000.
Haginomori, Eiichi, 4,493,008, Cl. 361-341.000.
Harada, Nozomu, 4,492,980, Cl. 358-213.000.
Hitomi, Hisakazu, 4,492,914, Cl. 323-313.000.
Kusakabe, Hiromi; and Ogawa, Atsushi, 4,492,926, Cl. 329-205.00R.
Kuze, Takashi, 4,492,603, Cl. 148-31.500.
Miyano, Toshiyuki; and Ohmura, Hideo, 4,492,072, Cl. 53-586.000.
Ogura, Mitsugi, 4,492,973, Cl. 357-23.000.
Okano, Haruo; and Horiike, Yasuhiro, 4,492,610, Cl. 156-643.000.
Suda, Kenichi; Tamaki, Katsuyuki; Tateishi, Kazushi; and Abe, Kohichiroh, 4,492,994, Cl. 360-85.000.
Sugimoto, Yasuhiro, 4,492,934, Cl. 331-117.00R.
Suzuki, Shinichi; Sasaki, Masayuki; Moriyasu, Toshinori; and Arakawa, Takao, 4,492,452, Cl. 354-430.000.
Tomita, Seiji; and Yokoyama, Hideo, 4,492,995, Cl. 360-96.500.
Tolfsen, Ulf, to Loyd's Industri A/S. Boks 609. Fastening means for safety beltscu4,492,007, Cl. 24-461.000.
Tomikawa, Koichi: *See*—
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Igarashi, Kouhei; and Tomita, Kazuo, 4,492,112, Cl. 73-117.300.
Tomita, Seiji; and Yokoyama, Hideo, to Tokyo Shibaura Denki Kabushiki Kaisha. Tape cassette loading and ejection devicecu4,492,995, Cl. 360-96.500.
Tomlinson, Harold W., Jr.: *See*—
Beall, Donald L.; Tomlinson, Harold W., Jr.; and Hart, William G., Jr., 4,493,105, Cl. 382-21.000.
Toray Silicone Co., Ltd.: *See*—
Koshii, Taro; and Yamashita, Mitsugu, 4,492,775, Cl. 521-77.000.
Torii, Nobutoshi: *See*—
Inaba, Hajimu; and Torii, Nobutoshi, 4,492,301, Cl. 198-472.000.
Touzani, William. Collapsible bottlecu4,492,313, Cl. 215-1.00C.
Toyama Machine Works, Ltd.: *See*—
Tani, Shigetaka; and Sasaki, Hisao, 4,492,510, Cl. 414-733.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Miura, Hideo, 4,492,571, Cl. 432-225.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Kumoi, Sadakatsu; Mitarai, Keiji; and Tsutsumi, Yukihiro, 4,492,803, Cl. 564-486.000.
Toyoda Gosei Co., Ltd.: *See*—
Ozawa, Isao; Aono, Yukio; and Ueno, Masato, 4,492,366, Cl. 267-140.100.
Toyota Jidosha Kabushiki Kaisha: *See*—
Donomoto, Tadashi; and Tanaka, Atsuo, 4,492,265, Cl. 164-493.000.
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Kawai, Yukio; Ogawa, Toshihisa; and Yoshida, Seietsu, 4,492,199, Cl. 123-440.000.
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Toyota Jidosha Kogyo Kabushikik Kaisha: *See*—
Moriyama, Masakazu; and Saito, Takao, 4,493,100, Cl. 381-43.000.
Trager, Ulrich; Sojka, Bernward; and Lange, Hans, to Boehringer Mannheim GmbH. Composition and method for the determination of hydrogen peroxidecu4,492,754, Cl. 435-28.000.
Transkrit Corporation: *See*—
Dicker, David, 4,492,334, Cl. 229-69.000.
Trebillon, Emile, to Rhone-Poulenc Specialites Chimiques. Preparation of ultrapure boehmites and/or pseudo-boehmitescu4,492,682, Cl. 423-626.000.
Treiber, Helmut: *See*—
Bickl, Horst; Findeis, Gunter; and Treiber, Helmut, 4,492,458, Cl. 355-38.000.
Trotel, Jacques: *See*—
de Chambost, Emmanuel; and Trotel, Jacques, 4,492,870, Cl. 250-398.000.
Trotta, Patrick A.; and Zak, Paul A., to Texas Instruments Incorporated. Low dispersion infrared glasscu4,492,763, Cl. 501-40.000.
Troxler, Eduard: *See*—
Orban, Ivan; and Troxler, Eduard, 4,492,791, Cl. 544-198.000.
Tsang, Paul J.: *See*—
Anantha, Narasipur G.; Ning, Tak H.; and Tsang, Paul J., 4,492,008, Cl. 29-571.000.
Tsuchihashi, Koji: *See*—
Hasegawa, Takashi; Tsuchihashi, Koji; and Yamashita, Hiroshi, 4,492,771, Cl. 502-420.000.
Tsuchiya, Yutaka; Inuzuka, Eiji; and Shinoda, Yuji, to Hamamatsu Terebi Kabushiki Kaisha. Trigger circuitcu4,492,879, Cl. 307-248.000.
Tsuda, Masaya; Yonemaru, Ken-Ichi; and Masuda, Yoshikazu, to Dainippon Screen Manufacturing Co., Ltd. Photomultiplier tube devicecu4,492,977, Cl. 358-75.000.
Tsuge, Kazuo, to Tokico Ltd. Air compressorcu4,492,533, Cl. 417-372.000.
Tsuji, Masanori: *See*—
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Tsutsumi, Yukihiro: *See*—
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Tuchiya, Yosimasa: *See*—
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Tudzynski, Paul: *See*—
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Turner Electric Corporation: *See*—
Turner, John L., 4,492,835, Cl. 200-144.00B.
Turner, Jan R.: *See*—
Blaszczak, Larry C.; Kukolja, Stjepan; and Turner, Jan R., 4,492,693, Cl. 424-246.000.
Blaszczak, Larry C.; and Turner, Jan R., 4,492,694, Cl. 424-246.000.
Turner, John L., to Turner Electric Corporation. Load interrupter devicecu4,492,835, Cl. 200-144.00B.
Ube Industries, Ltd.: *See*—
Fujii, Kozo; Nishihira, Keigo; Sawada, Hiroyuki; Tanaka, Shuji; Nakai, Mamoru; Yoshida, Hiroshi; and Inoue, Teruhiko, 4,492,792, Cl. 544-326.000.
Ubukata, Susumu; and Mizutani, Yasukazu, to Susumu Ubukata. Seismosensitive devicecu4,493,066, Cl. 367-178.000.
Uchida Manufacturing Co., Ltd.: *See*—
Uchida, Tetsue; and Adachi, Takao, 4,492,218, Cl. 126-96.000.
Uchida, Masahiro: *See*—
Suzuki, Takeshi; Murao, Mikio; Uchida, Masahiro; Kumagai, Chikanori; and Yotsui, Yasuhiko, 4,492,570, Cl. 432-106.000.
Uchida, Tetsue; and Adachi, Takao, to Uchida Manufacturing Co., Ltd. Oil stovecu4,492,218, Cl. 126-96.000.
Uchida, Yoko: *See*—
Suzuki, Atsushi; Yamada, Hiromichi; Uchida, Yoko; Kohno, Hideki; and Yoshida, Minoru, 4,492,869, Cl. 250-367.000.
Ude, Werner: *See*—
Besecke, Siegmund; Schroder, Gunter; Ude, Werner; and Wunderlich, Winfried, 4,492,805, Cl. 568-012.000.

Uehara, Haruo; and Sumitomo, Hiroyuki, to Hisaka Works, Ltd. Condensercu4,492,268, Cl. 165-166.000.
Uehara, Yumito: *See*—
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Uematsu, Hiroshi: *See*—
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Ueno, Masato: *See*—
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Ueno, Takashi: *See*—
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Ukrainsky Institut Inzhenerov Vodnogo Khozyaistva: *See*—
Sandulyak, Alexandr V.; Garaschenko, Vyacheslav I.; and Korkhov, Oleg J., 4,492,921, Cl. 324-204.000.
Ukrainsky Ordena Druzhby Narodov Institut Inzhenerov Vodnogo Khozyaistva: *See*—
Sandulyak, Alexandr V.; Garaschenko, Vyacheslav I.; and Yatskov, Nikolai V., 4,492,633, Cl. 210-223.000.
Umehara, Masayu. Apparatus for utilizing the impact force of bodies falling under gravitycu4,492,287, Cl. 185-33.000.
Undin, Hans: *See*—
Wiener, Hans; and Undin, Hans, 4,492,026, Cl. 30-90.900.
Unimation, Inc.: *See*—
Masaki, Ichiro; Shulman, Burt H.; and Gorman, Robert R., 4,492,847, Cl. 219-124.340.
Union Carbide Corporation: *See*—
Fletcher, Michael B., 4,492,587, Cl. 23-293.00R.
Wheeler, Thomas N., 4,492,799, Cl. 562-506.000.
Union Oil Company of California: *See*—
Switzer, Jay A., 4,492,811, Cl. 136-255.000.
Union Special Corporation: *See*—
Kaufmann, Juergen, 4,492,174, Cl. 112-248.000.
United Kingdom Atomic Energy Authority: *See*—
Drain, Leslie E.; and Negus, Clive R., 4,492,467, Cl. 356-336.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Murphy, Davis J.; and Phillips, Leslie N., 4,492,732, Cl. 428-404.000.
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National Aeronautics and Space Administration: *See*—
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Navy: *See*—
Alexander, Billy R., 4,492,014, Cl. 29-259.000.
Bottka, Nicholas; Lessoff, Howard; and Hills, Marian E., 4,492,434, Cl. 350-356.000.
Byram, George W., 4,492,923, Cl. 324-207.000.
Duhl, David N.; and Nguyen-Dinh, Xuan, 4,492,672, Cl. 420-448.000.
Geller, Myer; Keenan, Thomas E.; Altman, Daniel E.; and Patterson, Richard H., 4,493,114, Cl. 455-617.000.
Haas, George A.; Shih, Arnold; and Marrian, Christie R. K., 4,492,866, Cl. 250-305.000.
Hislop, Alfred R., 4,492,960, Cl. 343-5.0DD.
Lehto, Delbert L., 4,492,121, Cl. 73-705.000.
Rowe, Raymond A., 4,492,875, Cl. 290-53.000.
Werst, Mervin C., 4,493,047, Cl. 364-724.000.
U.S. Philips Corporation: *See*—
Broer, Dirk J.; and De Poorter, Adriaan W., 4,492,967, Cl. 346-135.100.
Cassanas, Claude; Couot, Jean-Pierre; and Royer, Jacques, 4,492,164, Cl. 101-216.000.
Joosten, Paul H.; Popma, Theo J. A.; Nabben, Hendrikus J. P.; Van Hal, Henricus A. M.; and Haisma, Jan, 4,492,721, Cl. 427-226.000.
Massaen, Egbertus J. P.; and de Jong, Frederik J., 4,492,451, Cl. 354-416.000.
Nicia, Antonius J. A.; and Potters, Cornelis J. T., 4,492,426, Cl. 350-96.150.
Schmidt, Johan M., 4,493,099, Cl. 381-14.000.
Sluyterman, Albertus A. S.; and Vink, Nicolaas G., 4,492,943, Cl. 335-213.000.
Staats, Jean B. C. H.; and Declerck, Gabriel D., 4,492,947, Cl. 338-22.00R.
vanBuul, Marinus C. W.; Raven, Johannes G.; and van de Ven, Wilhelmus H. C. A., 4,492,976, Cl. 358-11.000.
Wieters, Heinz, 4,492,891, Cl. 310-328.000.
United States Surgical Corporation: *See*—
Green, David T., 4,492,232, Cl. 128-325.000.
United Technologies Corporation: *See*—
Eitel, Frederick G.; and Hodges, Thomas J., 4,492,431, Cl. 350-310.000.
University of Nebraska, The Board of Regents of the: *See*—
Tao, Luh C.; and Blease, James W., 4,492,637, Cl. 210-711.000.
UOP Inc.: *See*—
Welsh, Lawrence B., 4,492,614, Cl. 204-1.00T.
Usami, Teruo: *See*—
Shima, Ichiji; Teshima, Hiroshi; Koizumi, Takayuki; and Usami, Teruo, 4,493,042, Cl. 364-507.000.
Usbeck, Gerhard: *See*—
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Ushiro, Tatsuzo: *See*—
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USM Corporation: *See*—
Kulik, Alphonse C., 4,491,996, Cl. 12-10.100.
Price, Frank C., 4,491,997, Cl. 12-12.100.
Vackier, Leo N.; Mampaey, Jozef L.; and Alaerts, Leo B., to AGFA-Gevaert N.V. Apparatus for transferring xerographic imagescu4,492,177, Cl. 118-651.000.
Vadakan, Vivatvong V.: *See*—
Agrawal, Anil K.; Mullen, Philip G.; and Vadakan, Vivatvong V., 4,493,021, Cl. 364-200.000.
Vaillancourt, Vincent: *See*—
Lichtenstein, Joseph; and Vaillancourt, Vincent, 4,492,258, Cl. 141-1.000.
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Valeo: *See*—
Bertin, Patrice, 4,492,283, Cl. 180-148.000.
Cadars, Patrick, 4,492,267, Cl. 165-104.320.
Jacquet, Maurice; and Le Du, Jean-Claude, 4,492,361, Cl. 251-356.000.
Valint, Paul L., Jr.; and Bock, Jan, to Exxon Research and Engineering Co. Water soluble block polymerscu4,492,785, Cl. 524-529.000.
Valley, George C., to Hughes Aircraft Company. Agile beam lasercu4,493,085, Cl. 372-19.000.
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Matarainen, Reino, 4,492,612, Cl. 162-360.00R.
Van Allen, Kent; and Bordato, James M., to Scans Associates, Inc. Weigh scalecu4,492,281, Cl. 177-213.000.
vanBuul, Marinus C. W.; Raven, Johannes G.; and van de Ven, Wilhelmus H. C. A., to U.S. Philips Corporation. Line standard conversion circuit for a television signalcu4,492,976, Cl. 358-11.000.
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van de Ven, Wilhelmus H. C. A.: *See*—
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Van Hal, Henricus A. M.: *See*—
Joosten, Paul H.; Popma, Theo J. A.; Nabben, Hendrikus J. P.; Van Hal, Henricus A. M.; and Haisma, Jan, 4,492,721, Cl. 427-226.000.
van Nederkassel, Ludovicus J.: *See*—
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van Zanten, Anton, to Robert Bosch GmbH. Method and apparatus for recognizing irregular combustion processes in an internal combustion enginecu4,492,108, Cl. 73-35.000.
Varshney, Ramesh C., to Fairchild Camera & Instrument Corp. Serial-parallel-serial charged coupled device memory and a method of transferring charge thereincu4,493,060, Cl. 365-238.000.
Veillard, Dominique H., to Eastman Kodak Company. Zero overhead sync in data recordingcu4,493,093, Cl. 375-110.000.
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Pakosh, Daniel, 4,492,237, Cl. 130-27.00R.
Vertimag Systems Corporation: *See*—
Johnson, Clark E., Jr., 4,492,990, Cl. 360-32.000.
Vestergaard, Alex D., to Ingeniorfirmaet Lytzen KS. Ovencu4,492,569, Cl. 432-72.000.
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Garcia, Frank, Jr.; and Brown, David L., 4,492,362, Cl. 251-363.000.
Vici Bailey: *See*—
Bailey, Arthur, deceased; and Bailey, Vici, executor, 4,492,418, Cl. 312-220.000.
Vickers Limited: *See*—
Smith, Francis H., 4,492,470, Cl. 356-372.000.
Victor Company of Japan, Ltd.: *See*—
Inami, Mamoru; Tanaka, Yoshiaki; and Ohtsuki, Zenju, 4,492,917, Cl. 324-77.00A.
Saito, Takashi, 4,492,996, Cl. 360-99.000.
Shibata, Norio, 4,493,072, Cl. 369-271.000.
Victoria University of Manchester, The: *See*—
Kantorowich, Roy H., 4,492,489, Cl. 403-319.000.
Villa-Real, Antony-Euclid C., to EMDE Medical Research. Pre-evacuated blood collection tube with anti-hemolysis baffle system and centrifugation propelled filtration disc and efficient serum-from cells separatorcu4,492,634, Cl. 210-398.000.
Vink, Nicolaas G.: *See*—
Sluyterman, Albertus A. S.; and Vink, Nicolaas G., 4,492,943, Cl. 335-213.000.
Vinn, Charles L.: *See*—
Harris, David J.; and Vinn, Charles L., 4,492,954, Cl. 340-347.0DA.
Virta, Matti: *See*—
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Lugscheider, Walter; Kilches, Helmut D.; Riegler, Ernst; and Zajicek, Ernst, 4,493,088, Cl. 373-22.000.
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Vogel, Horst: *See*—
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Vogel, Horst H.: *See*—
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Voirin, Jean-Philippe; and Cherbuy, Bernard, to Cii Honeywell Bull (Societe Anonyme). Apparatus for applying solid developer particles to the recording element of a non-impact printercu4,492,178, Cl. 118-653.000.
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Belykh, Sergei I.; Moschensky, Anatoly D.; Davydov, Anatoly B.; Pershin, Gely G.; Smirnov, Boris A.; and Gromov, Mikhail V., 4,492,226, Cl. 128-92.0BC.
Vyne, Robert L., to Motorola, Inc. Operational amplifier having enhanced gain through current feedbackcu4,492,929, Cl. 330-253.000.
W. Schlafhorst & Co.: *See*—
Raasch, Hans; and Busch, Dieter, 4,492,077, Cl. 57-414.000.
Romic, Ivica; and Loos, Jurgen, 4,492,076, Cl. 57-22.000.
W. W. Sly Manufacturing Co., The: *See*—
Ball, David C., 4,492,294, Cl. 193-25.00C.
Wadso, Ingemar; Suurkuusk, Jaak; and Taylor, Robert L. Probe for use in a microcalorimetercu4,492,480, Cl. 374-33.000.
Wadsworth, Jeffrey: *See*—
Ruano, Oscar; Wadsworth, Jeffrey; and Sherby, Oleg D., 4,492,671, Cl. 419-48.000.
Wagner, Frederick B., III: *See*—
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Waldhauser, Steven J.; and Corneil, Dennis J., to Wetrok, Inc. Floor cleaning machinecu4,492,002, Cl. 15-320.000.
Walker-Neer Manufacturing Company Inc.: *See*—
Haney, Keith M., 4,492,501, Cl. 414-22.000.
Walker, Ronald I. Cutting assembly system for pipe casings and the likecu4,492,136, Cl. 83-169.000.
Wallace Murray Corporation: *See*—
Owen, Bruce R.; and Sarle, R. Charles, 4,492,519, Cl. 415-145.000.
Wallach, Steven J.: *See*—
Gavrin, Edward S.; Bratt, Richard G.; Schleimer, Stephen I.; Pilat, John F.; Richmond, Michael S.; Wallach, Walter A., Jr.; Belgard, Richard A.; Farber, David A.; Ahlstrom, John K.; Wallach, Steven J.; Clancy, Gerald F.; Mundie, Craig J.; Jones, Thomas M.; Bachman, Brett L.; and Bernstein, David H., 4,493,023, Cl. 364-200.000.
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Yotsui, Yasuhiko: *See*—
Suzuki, Takeshi; Murao, Mikio; Uchida, Masahiro; Kumagai, Chikanori; and Yotsui, Yasuhiko, 4,492,570, Cl. 432-106.000.
Young, Charles J.: *See*—
Bachman, Brett L.; Nealon, James T.; and Young, Charles J., 4,493,025, Cl. 364-200.000.
Baxter, Ward, II; Clancy, Gerald F.; Gruner, Ronald H.; Mundie, Craig J.; Bachman, Brett L.; Redfield, Stephen R.; Coder, William N.; Jones, Thomas M.; Houseman, David L.; Young, Charles J.; and Haeffele, Steven M., 4,493,024, Cl. 364-200.000.
Young, Lawrence C., to Double E Company Inc. Positive retracting mechanical expansible shaftcu4,492,346, Cl. 242-72.100.
Young, Lock R., to Harris Corporation. Symmetrically-configured variable ratio power combiner using septum polarizer and quarter-wave platecu4,492,938, Cl. 333-111.000.
Young, Raymond H.; Morris, Horton H.; and Brooks, Robert L., to Freeport Kaolin Company. Method of treating clay to improve its whitenesscu4,492,628, Cl. 209-5.000.
Youssef, Nabil N. Wild bee nesting domicilecu4,491,994, Cl. 6-1.000.
Yuda, Lawrence F. Robotic gripper operator mechanismcu4,492,400, Cl. 294-88.000.
Yueh, William R., to General Dynamics, Pomona Division. Noise-adaptive, predictive proportional navigation (NAPPN) guidance schemecu4,492,352, Cl. 244-3.150.
Yutaka, Otobe, to Honda Giken Kogyo Kabushiki Kaisha. Fuel supply control method for an internal combustion engine equipped with a supercharger, having a fail-safe function for abnormality in intake passage pressure sensor meanscu4,492,203, Cl. 123-478.000.
Zajac, Edward: *See*—
McCabe, Barkman C.; and Zajac, Edward, 4,492,083, Cl. 60-641.500.
Zajicek, Ernst: *See*—
Lugscheider, Walter; Kilches, Helmut D.; Riegler, Ernst; and Zajicek, Ernst, 4,493,088, Cl. 373-22.000.
Zak, Paul A.: *See*—
Trotta, Patrick A.; and Zak, Paul A., 4,492,763, Cl. 501-40.000.
Zannoni, Cristiano, to Phillips Petroleum Company. Apparatus and method for drying particulate materialcu4,492,043, Cl. 34-39.000.
Zapletal, Henry; Wentzek, Horst F.; and Chembakaffery, George M., to Leggett & Platt, Incorporated. Coil spring assembly machinecu4,492,298, Cl. 198-409.000.
Zaragoza, Antoine; and Zaragoza, Raymond. Scraper to rough down the surfaces of a coated finishcu4,492,011, Cl. 29-81.00G.
Zaragoza, Raymond: *See*—
Zaragoza, Antoine; and Zaragoza, Raymond, 4,492,011, Cl. 29-81.00G.
Zavodny, Eugene N., to Maremont Corporation. Acceleration sensitive compression headcu4,492,290, Cl. 188-322.140.
Zawodny, Arthur; and Kryscki, Jerzy, to Keystone Camera Corporation. Camera having film feed indicatorcu4,492,446, Cl. 354-215.000.
Zelenski, Jerome J.: *See*—
Witmore, Ronald K.; and Zelenski, Jerome J., 4,493,073, Cl. 370-14.000.
Ziegler, Michael L.; and Druke, Michael B., to Data General Corporation. Dual port cache with interleaved read accesses during alternate half-cycles and simultaneous writingcu4,493,033, Cl. 364-200.000.
Zimmer, John. Apparatus for compacting refusecu4,492,156, Cl. 100-229.00R.
Zimmermann, Urs: *See*—
Malles-Herrero, Jose; Leroy, Daniel; Zimmermann, Urs; and Charlat, Patrice, 4,492,541, Cl. 418-23.000.
Zimmern, Bernard. Global worm machine with seizure-preventing cellscu4,492,542, Cl. 418-46.000.
Zimmerschied, Klaus; and Rinno, Helmut, to Hoechst Aktiengesellschaft. Process for the preparation of a polymer dispersioncu4,492,780, Cl. 524-45.000.
Zinke, Horst: *See*—
Maul, Rudolf; Otto, Eberhard; and Zinke, Horst, 4,492,661, Cl. 260-976.000.
Ziv, Avraham; and Tanaka, Akira, to American Safety Equipment Corporation. Protractive force responsive safety belt locking apparatuscu4,492,348, Cl. 242-107.200.
Zollner, Rainer, to Grundig E.M.V. Housing for tape cassettecu4,492,351, Cl. 242-197.000.
Zolnowsky, John E.: *See*—
MacGregor, Douglas B.; Moyer, William C.; Mills, Marvin A., Jr.; and Zolnowsky, John E., 4,493,035, Cl. 364-200.000.
Zoltner, John D., to Xerox Corporation. Apparatus for dispensing toner particles and sealing the storage chamber thereofcu4,492,321, Cl. 222-410.000.
Zurkinden, Pierre. Sports ground covering with expanded clay particlescu4,492,728, Cl. 428-240.000.
Zverina, Karel; and Kroupa, Petr, to Ceskoslovenska akademie ved. Spray-coating materialcu4,492,766, Cl. 501-104.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF JANUARY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Berman, Joel; and Weinreich, Stephen D., to Berman, Joel. Window shade roller assemblycuRe. 31,793, Cl. 160-309.000.

Burgdorf, Jochen; Klose, Karl-Heinz; and Storzel, Karl, to ITT Industries, Inc. Spot-type disc brakecuRe. 31,794, Cl. 188-73.350.

Colomer, Pierre, to Interfiltre S.A. Filter with automatic cleaningcuRe. 31,792, Cl. 134-181.000.

Dice, Harry E., Sr., to Hardesty, George K. C., a part interest. Pickproof lockcuRe. 31,791, Cl. 70-421.000.

Hardesty, George K. C.: *See*—
Dice, Harry E., Sr., Re. 31,791, Cl. 70-421.000.

Interfiltre S.A.: *See*—
Colomer, Pierre, Re. 31,792, Cl. 134-181.000.

Isobe, Mitsuhide: *See*—
Nagano, Masashi; and Isobe, Mitsuhide, Re. 31,796, Cl. 474-82.000.

ITT Industries, Inc.: *See*—
Burgdorf, Jochen; Klose, Karl-Heinz; and Storzel, Karl, Re. 31,794, Cl. 188-73.350.

Kabushiki Kaisha Gemvac: *See*—
Sakuma, Shinzo; and Warabi, Junichi, Re. 31,797, Cl. 200-144.00B.

Kabushiki Kaisha Meidensha: *See*—
Sakuma, Shinzo; and Warabi, Junichi, Re. 31,797, Cl. 200-144.00B.

Klose, Karl-Heinz: *See*—
Burgdorf, Jochen; Klose, Karl-Heinz; and Storzel, Karl, Re. 31,794, Cl. 188-73.350.

Nagano, Masashi; and Isobe, Mitsuhide, to Shimano Industrial Company Limited. Derailleur for bicycles and similar vehiclescuRe. 31,796, Cl. 474-82.000.

Reed, Martin R.: *See*—
Weber, Franz K.; and Reed, Martin R., Re. 31,798, Cl. 362-352.000.

Rohrbacher, Herbert E. Apparatus for rolling chain link fencecuRe. 31,795, Cl. 242-54.00R.

Sakuma, Shinzo; and Warabi, Junichi, to Kabushiki Kaisha Meidensha; and Kabushiki Kaisha Gemvac. Arc-shield supporting structure of a vacuum power interrupterscuRe. 31,797, Cl. 200-144.00B.

Shimano Industrial Company Limited: *See*—
Nagano, Masashi; and Isobe, Mitsuhide, Re. 31,796, Cl. 474-82.000.

Storzel, Karl: *See*—
Burgdorf, Jochen; Klose, Karl-Heinz; and Storzel, Karl, Re. 31,794, Cl. 188-73.350.

Warabi, Junichi: *See*—
Sakuma, Shinzo; and Warabi, Junichi, Re. 31,797, Cl. 200-144.00B.

Weber, Franz K.; and Reed, Martin R. Knockdown shade assembly for lighting fixturecuRe. 31,798, Cl. 362-352.000.

Weinreich, Stephen D.: *See*—
Berman, Joel; and Weinreich, Stephen D., Re. 31,793, Cl. 160-309.000.

LIST OF DESIGN PATENTEES

A. Ahlstrom Osakeyhtio: *See*—
Wirkkala, Veli T., 277,079, Cl. D9-378.000.

AB Perma System: *See*—
Brolin, Hans R., 277,062, Cl. D6-580.000.

American Greetings Corporation: *See*—
Shaffer, Ralph; and Davidson, William, 277,121, Cl. D21-159.000.
Shaffer, Ralph; and Davidson, William, 277,122, Cl. D21-159.000.
Shaffer, Ralph; and Davidson, William, 277,123, Cl. D21-159.000.
Shaffer, Ralph; and Davidson, William, 277,124, Cl. D21-59.000.
Shaffer, Ralph; and Davidson, William, 277,125, Cl. D21-159.000.

Aoija, Dieudonne G., to U.S. Philips Corporation. Portable radio receivercu277,099, 1-8-85, Cl. D14-71.000.

Arch Crown Tags, Inc.: *See*—
Liebman, Norman, 277,115, Cl. D20-27.000.

Arend, Rene, to Restaurant Technology, Inc. Formed meat productcu277,045, 1-8-85, Cl. D1-199.000.

Ball, Ralph V.; and Pape, John E., to J & J Recreation, Inc. Motorized bumper boatcu277,095, 1-8-85, Cl. D12-307.000.

Baron, Peter. Belt bucklecu277,051, 1-8-85, Cl. D2-394.000.

Baron, Peter. Frame belt bucklecu277,052, 1-8-85, Cl. D2-394.000.

Barrett, Bernard R. Kite planecu277,117, 1-8-85, Cl. D21-89.000.

Biesecker, Frederick N., to Drug Plastics & Glass Company. Bottlecu277,076, 1-8-85, Cl. D9-355.000.

Blais, Cecile; Liechti, Willy; and Broderick, Elizabeth. Perfume bottlecu277,075, 1-8-85, Cl. D9-310.000.

Boone, Sheila T. Facial pillowcu277,059, 1-8-85, Cl. D6-601.000.

Broderick, Elizabeth: *See*—
Blais, Cecile; Liechti, Willy; and Broderick, Elizabeth, 277,075, Cl. D9-310.000.

Brolin, Hans R., to AB Perma System. Worm gear unit for venetian blinds or the likecu277,062, 1-8-85, Cl. D6-580.000.

Bruseloff, Ilene G. Dusting glovecu277,050, 1-8-85, Cl. D2-361.000.

Buchanan, James W. Animal leash bracketcu277,055, 1-8-85, Cl. D6-566.000.

Caplygin, Dimitri, to Girlock Limited. Disc brake pad unitcu277,093, 1-8-85, Cl. D12-180.000.

Cascarano, Anthony J.: *See*—
Matsuda, Hari; Cascarano, Anthony J.; and Schwimmer, Charles M., 277,100, Cl. D14-76.000.

Chen, Ming-Ter. Plate or the likecu277,065, 1-8-85, Cl. D7-36.000.

Consolidated Foods Corporation: *See*—
DiTullio, Flavia, 277,047, Cl. D2-24.000.

Consortium Vinicole de Bordeaux et de la Gironde: *See*—
Dourthe, Pierre, 277,078, Cl. D9-378.000.

Czech, Joachim. Dispenser for flowable productscu277,072, 1-8-85, Cl. D9-366.000.

Czech, Joachim. Dispenser for flowable productscu277,073, 1-8-85, Cl. D9-366.000.

Czech, Joachim. Dispenser for flowable productscu277,074, 1-8-85, Cl. D9-366.000.

Daniels, Phillip D. Bathtubcu277,128, 1-8-85, Cl. D23-55.000.

Davidson, William: *See*—
Shaffer, Ralph; and Davidson, William, 277,121, Cl. D21-159.000.
Shaffer, Ralph; and Davidson, William, 277,122, Cl. D21-159.000.
Shaffer, Ralph; and Davidson, William, 277,123, Cl. D21-159.000.
Shaffer, Ralph; and Davidson, William, 277,124, Cl. D21-59.000.
Shaffer, Ralph; and Davidson, William, 277,125, Cl. D21-159.000.

DiTullio, Flavia, to Consolidated Foods Corporation. Brassierecu277,047, 1-8-85, Cl. D2-24.000.

Dourthe, Pierre, to Consortium Vinicole de Bordeaux et de la Gironde. Wine bottlecu277,078, 1-8-85, Cl. D9-378.000.

Dragan, William B. Dental syringecu277,134, 1-8-85, Cl. D24-24.000.

Drug Plastics & Glass Company: *See*—
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Dudley, Wayne C. Three-wheeled trailercu277,086, 1-8-85, Cl. D12-101.000.

Dunlop Limited: *See*—
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E. B. Harvey & Co.: *See*—
Harvey, Edward B., 277,081, Cl. D10-33.000.

Edwards, William H. Guitarcu277,106, 1-8-85, Cl. D17-18.000.

Electrolux Constructor Aktiebolag: *See*—
Tortensson, Anna G. D., 277,058, Cl. D6-468.000.

Elektro-Warmetechnik Siegfried Petz Co.: *See*—
Schade, Hans U., 277,130, Cl. D23-122.000.

Elkerbout, Marten F., to U.S. Philips Corporation. Coffee makercu277,070, 1-8-85, Cl. D7-309.000.

Fechtner, Harold F.: *See*—
Mackay, Spencer L.; Price, Cleophus, Jr.; and Fechtner, Harold F., 277,127, Cl. D23-7.000.

Fisher, Carolyn P.: *See*—
Fisher, Larry M., 277,087, Cl. D12-102.000.

Fisher, Larry M., to Fisher, Carolyn P. Snack wagoncu277,087, 1-8-85, Cl. D12-102.000.

Franklin, Robert P., to Trans-World Manufacturing Corp. Merchandise display stand or similar articlecu277,057, 1-8-85, Cl. D6-480.000.

Gagnon, Paul L. Portable handle for flanged-neck containerscu277,080, 1-8-85, Cl. D9-434.000.

Girlock Limited: *See*—
Caplygin, Dimitri, 277,093, Cl. D12-180.000.

Golden, Seymour W.; and Kehl, Robert N. Seatcu277,053, 1-8-85, Cl. D6-373.000.

Gordon, Ramon. Position identification insignia for football player's uniformcu277,109, 1-8-85, Cl. D20-11.000.

Gordon, Ramon. Position identification insignia for football player's uniformcu277,110, 1-8-85, Cl. D20-11.000.

Gordon, Ramon. Position identification insignia for football player's uniformcu277,111, 1-8-85, Cl. D20-11.000.

Gordon, Ramon. Position identification insignia for football player's helmetcu277,112, 1-8-85, Cl. D20-11.000.

Gordon, Ramon. Position identification insignia for football player's helmetcu277,113, 1-8-85, Cl. D20-11.000.

Gordon, Ramon. Position identification insignia for football player's helmetcu277,114, 1-8-85, Cl. D20-11.000.

Handi-Pac, Inc.: *See*—
Klawitter, Ronald R., 277,118, Cl. D21-120.000.

Hara, Kunio; and Yasutani, Shigeki, to Tokyo Shibaura Denki Kabushiki Kaisha. Reader for image information storing/retrieving machinecu277,101, 1-8-85, Cl. D14-107.000.

Harima, Atsuhiro: *See*—
Hayashi, Yoshimoto; Harima, Atsuhiro; and Tajima, Tsune, 277,132, Cl. D24-8.000.

Harvey, Edward B., to E. B. Harvey & Co. Watchcu277,081, 1-8-85, Cl. D10-33.000.

Hauser, Richard F., to Trim, Inc. Picture framecu277,063, 1-8-85, Cl. D6-303.000.

Hayashi Denki Co., Ltd.: *See*—
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Hayashi, Yoshimoto; Harima, Atsuhiro; and Tajima, Tsune, to Hayashi Denki Co., Ltd. Small animal holder for use with apparatus measuring blood pressure of small animalcu277,132, 1-8-85, Cl. D24-8.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Iwakura, Masato; Ohshima, Yasuaki; and Ito, Masamoto, 277,090, Cl. D12-110.000.

Hostetler, Paul E. Screen doorcu277,138, 1-8-85, Cl. D25-49.000.

Houlihan, John T., to Timex Medical Products Corporation. Digital sphygmomanometercu277,133, 1-8-85, Cl. D24-17.000.

Hsieh, Yung T. Wheel covercu277,094, 1-8-85, Cl. D12-209.000.

Hull, James R. Convertible bedcu277,054, 1-8-85, Cl. D6-393.000.

Hurco Manufacturing Co., Inc.: *See*—
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Ibrahimpasic, Ibrahim. Edge findercu277,082, 1-8-85, Cl. D10-61.000.

Ibrahimpasic, Ibrahim. Edge findercu277,083, 1-8-85, Cl. D10-61.000.

International Jensen Incorporated: *See*—
Matsuda, Hari; Cascarano, Anthony J.; and Schwimmer, Charles M., 277,100, Cl. D14-76.000.

International Playtex, Inc.: *See*—
Taniyama, Toshiko, 277,046, Cl. D2-24.000.

Ito, Masamoto: *See*—
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Iwakura, Masato; Ohshima, Yasuaki; and Ito, Masamoto, to Honda Giken Kogyo Kabushiki Kaisha. Motorcyclecu277,090, 1-8-85, Cl. D12-110.000.

J & J Recreation, Inc.: *See*—
Ball, Ralph V.; and Pape, John E., 277,095, Cl. D12-307.000.

Jackson, Glen C. Vacuum testing device for sealed containerscu277,084, 1-8-85, Cl. D10-83.000.

Janome Sewing Machine Co., Ltd.: *See*—
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Johnston, Joseph E., to Lucasfilm, Ltd. Toy vehiclecu277,116, 1-8-85, Cl. D21-87.000.

Johnston, Joseph E., to Lucas Film, Ltd. Toy vehiclecu277,120, 1-8-85, Cl. D21-130.000.

Kaneko, Yoichi, to Shiseido Company Ltd. Cosmetic bottlecu277,077, 1-8-85, Cl. D9-367.000.

Kehl, Robert N.: *See*—
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Klawitter, Ronald R., to Handi-Pac, Inc. Toy circular sawcu277,118, 1-8-85, Cl. D21-120.000.

Kuhlman, Harvey G. Pizza shellcu277,044, 1-8-85, Cl. D1-130.000.

Kuroki, Nobufusa, to Janome Sewing Machine Co., Ltd. Sewing machinecu277,102, 1-8-85, Cl. D15-70.000.

Larson, Donavan R.; Larson, Herbert A. F.; and Larson, Gregory A. Wood burning stovecu277,129, 1-8-85, Cl. D23-97.000.

Larson, Gregory A.: *See*—
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Larson, Herbert A. F.: *See*—
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Lee's Manufacturing Company, Inc.: *See*—
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Levine, Leonard. Roll and bagel slicing jigcu277,066, 1-8-85, Cl. D7-43.000.

Liebman, Norman, to Arch Crown Tags, Inc. Spectacle tagcu277,115, 1-8-85, Cl. D20-27.000.

Liebrick, William C.; and Morvillo, Charles A., to Lee's Manufacturing Company, Inc. Jewelry settingcu277,085, 1-8-85, Cl. D11-92.000.

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Lundquist, Lynn. Circular slide rulecu277,108, 1-8-85, Cl. D18-10.000.

Mackay, Spencer L.; Price, Cleophus, Jr.; and Fechtner, Harold F., to Rain Bird Consumer Products Mfg. Corp. Turret top sprinklercu277,127, 1-8-85, Cl. D23-7.000.

Malagnoux, Roger, to Societe d'Exploitation des Etablissements Pierre-Grehal. Head for a plug gripcu277,071, 1-8-85, Cl. D8-52.000.

Mark, Andrew, to Salton, Inc. Radiocu277,098, 1-8-85, Cl. D14-68.000.

Matsuda, Hari; Cascarano, Anthony J.; and Schwimmer, Charles M., to International Jensen Incorporated. Receiver front panel assemblycu277,100, 1-8-85, Cl. D14-76.000.

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Murakami, Tsuyoshi, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Motor-four-wheeler cyclecu277,088, 1-8-85, Cl. D12-107.000.

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Peyser, Irwin, 277,049, Cl. D2-184.000.

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Neale, Robert R. Display rack for water skiscu277,064, 1-8-85, Cl. D6-467.000.

Nicholson, James H., to Telic Systems, Inc. Folding tablecu277,056, 1-8-85, Cl. D6-420.000.

Numbers, Jody L. Thin flat sided hand held weaponcu277,126, 1-8-85, Cl. D22-1.000.

Ohshima, Yasuaki: *See*—
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Ostergard, Andra S. Refrigerator beverage dispensercu277,067, 1-8-85, Cl. D7-302.000.

Ostergard, Andra S. Refrigerator beverage dispensercu277,068, 1-8-85, Cl. D7-302.000.

Ostergard, Andra S. Refrigerator beverage dispensercu277,069, 1-8-85, Cl. D7-302.000.

Osterlin, Kenneth. Combined slide projector and slide magazinecu277,105, 1-8-85, Cl. D16-21.000.

Paczko, Terry, to Questor Corp. Toy hammercu277,119, 1-8-85, Cl. D21-120.000.

Pape, John E.: *See*—
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Peyser, Irwin, to MV Corp. Combination jacket and carrier bagcu277,048, 1-8-85, Cl. D2-184.000.

Peyser, Irwin, to MV Corp. Combination jacket and carrier bagcu277,049, 1-8-85, Cl. D2-184.000.

Picoy, Anthony R. Roman shadecu277,061, 1-8-85, Cl. D6-575.000.

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Restaurant Technology, Inc.: *See*—
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Ripley, Wayne H. Ice making machinecu277,103, 1-8-85, Cl. D15-80.000.

Roch, Gerald V., to Hurco Manufacturing Co., Inc. Bed-type milling machinecu277,104, 1-8-85, Cl. D15-131.000.

Sakaki, Nobuyuki, to Dunlop Limited. Tire for a vehicle wheelcu277,091, 1-8-85, Cl. D12-136.000.

Sakamoto, Junichi, to Sharp Corporation. Cash registercu277,107, 1-8-85, Cl. D18-4.000.

Salton, Inc.: *See*—
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Schade, Hans U., to Elektro-Warmetechnik Siegfried Petz Co. Fanforced heatercu277,130, 1-8-85, Cl. D23-122.000.

Schwimmer, Charles M.: *See*—
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Shaffer, Ralph; and Davidson, William, to American Greetings Corporation. Toy bear figurecu277,121, 1-8-85, Cl. D21-159.000.

Shaffer, Ralph; and Davidson, William, to American Greetings Corporation. Toy bear figurecu277,122, 1-8-85, Cl. D21-159.000.

Shaffer, Ralph; and Davidson, William, to American Greetings Corporation. Toy bear figurecu277,123, 1-8-85, Cl. D21-159.000.

Shaffer, Ralph; and Davidson, William, to American Greetings Corporation. Toy bear figurecu277,124, 1-8-85, Cl. D21-59.000.

Shaffer, Ralph; and Davidson, William, to American Greetings Corporation. Toy bear figurecu277,125, 1-8-85, Cl. D21-159.000.

Shames, Harold: *See*—
Shames, Sidney J.; and Shames, Harold, 277,131, Cl. D23-151.000.

Shames, Sidney J.; and Shames, Harold. Housing for a clothes dryer ventcu277,131, 1-8-85, Cl. D23-151.000.

Sharp Corporation: *See*—
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Shiseido Company Ltd.: *See*—
Kaneko, Yoichi, 277,077, Cl. D9-367.000.

Societe d'Exploitation des Etablissements Pierre-Grehal: *See*—
Malagnoux, Roger, 277,071, Cl. D8-52.000.

Sullivan, George P. Combination fiberglass swimming pool and spacu277,135, 1-8-85, Cl. D24-38.000.

Sumitomo Rubber Industries, Ltd.: *See*—
Nagayasu, Hideaki, 277,092, Cl. D12-146.000.

Suzuki Jidosha Kogyo Kabushiki Kaisha: *See*—
Murakami, Tsuyoshi, 277,088, Cl. D12-107.000.

Tajima, Tsune: *See*—
Hayashi, Yoshimoto; Harima, Atsuhiro; and Tajima, Tsune, 277,132, Cl. D24-8.000.
Taniyama, Toshiko, to International Playtex, Inc. Brassierecu277,046, 1-8-85, Cl. D2-24.000.
Teleconcepts, Inc.: *See*—
Winkler, Myra, 277,096, Cl. D14-53.000.
Winkler, Myra, 277,097, Cl. D14-53.000.
Telic Systems, Inc.: *See*—
Nicholson, James H., 277,056, Cl. D6-420.000.
Timex Medical Products Corporation: *See*—
Houlihan, John T., 277,133, Cl. D24-17.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hara, Kunio; and Yasutani, Shigeki, 277,101, Cl. D14-107.000.
Tortemson, Anna G. D., to Electrolux Constructor Aktiebolag. Storage rack for elongate goodscu277,058, 1-8-85, Cl. D6-468.000.
Tosti, Luigi. Hand propelled child's vehiclecu277,089, 1-8-85, Cl. D12-107.000.
Trans-World Manufacturing Corp.: *See*—
Franklin, Robert P., 277,057, Cl. D6-480.000.
Trim, Inc.: *See*—
Hauser, Richard F., 277,063, Cl. D6-303.000.
Ullven, Gunnar A. Bed pan mattresscu277,060, 1-8-85, Cl. 5-60.000.
U.S. Philips Corporation: *See*—
Aoijs, Dieudonne G., 277,099, Cl. D14-71.000.
Elkerbout, Marten F., 277,070, Cl. D7-309.000.
Van der Upwich, Stijn. Barbecue stand or the likecu277,136, 1-8-85, Cl. D25-1.000.
Van der Upwich, Stijn. Barbecue stand or the likecu277,137, 1-8-85, Cl. D25-1.000.
Winkler, Myra, to Teleconcepts, Inc. Telephonecu277,096, 1-8-85, Cl. D14-53.000.
Winkler, Myra, to Teleconcepts, Inc. Combined telephone and stand thereforcu277,097, 1-8-85, Cl. D14-53.000.
Wirkkala, Veli T., to A. Ahlstrom Osakeyhtio. Bottle or similar articlecu277,079, 1-8-85, Cl. D9-378.000.
Yasutani, Shigeki: *See*—
Hara, Kunio; and Yasutani, Shigeki, 277,101, Cl. D14-107.000.

LIST OF PLANT PATENTEES

Hope, Claude, to Pan American Plant Company. Kalanchoe plant named "Acapulco" cu5,384, 1-8-85, Cl. 68.000.

Hope, Claude, to Pan American Plant Company. Kalanchoe plant named Cozumelcu5,385, 1-8-85, Cl. 68.000.

Hope, Claude, to Pan American Plant Company. Kalanchoe plant named Granadacu5,386, 1-8-85, Cl. 68.000.

Hope, Claude, to Pan American Plant Company. Kalanchoe plant named Cancuncu5,387, 1-8-85, Cl. 68.000.

Pan American Plant Company: *See*—
Hope, Claude, 5,384, Cl. 68.000.
Hope, Claude, 5,385, Cl. 68.000.
Hope, Claude, 5,386, Cl. 68.000.
Hope, Claude, 5,387, Cl. 68.000.

CLASSIFICATION OF PATENTS

ISSUED JANUARY 8, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

171	4,491,985

CLASS 3

1.5	4,491,986
1.91	4,491,987

CLASS 4

228	4,491,988
251	4,491,989
607	4,491,990
661	4,491,991

CLASS 5

93 R	4,491,992
451	4,491,993

CLASS 6

1	4,491,994

CLASS 8

158	4,491,995
471	4,492,584
493	4,492,585
528	4,492,586

CLASS 12

10.1	4,491,996
12.1	4,491,997

CLASS 15

119 A	4,491,998
230	4,491,999
242	4,492,000
320	4,492,001
	4,492,002
406	4,492,003

CLASS 23

293 R	4,492,587

CLASS 24

20 R	4,492,004
270	4,492,005
382	4,492,006
461	4,492,007

CLASS 28

254	4,492,009

CLASS 29

1.22	4,492,010
81 G	4,492,011
148.4 D	4,492,012
157 R	4,492,013
259	4,492,014
281.5	4,492,015
432	4,492,016
434	4,492,017
437	4,492,018
447	4,492,019
571	4,492,008
600	4,492,020
623.1	4,492,021
787	4,492,022
861	4,492,023

CLASS 30

87	4,492,024
	4,492,025
90.9	4,492,026
276	4,492,027
296 A	4,492,028
384	4,492,030

CLASS 33

1 PT	4,492,031
125 C	4,492,033
125 R	4,492,032
170	4,492,034
172 B	4,492,035
180 R	4,492,036
366	4,492,029
367	4,492,037
379	4,492,038

CLASS 34

4	4,492,039
10	4,492,040
15	4,492,041
35	4,492,042
39	4,492,043
114	4,492,044
122	4,492,045

CLASS 36

27	4,492,046
134	4,492,047

CLASS 40

2 R	4,492,048
624	4,492,049

CLASS 42

1 V	4,492,050
87	4,492,051

CLASS 43

12	4,492,052
15	4,492,053
42.23	4,492,054
88	4,492,055
96	4,492,056

CLASS 44

1 R	4,492,588
51	4,492,589
	4,492,590

CLASS 51

178	4,492,059
283 R	4,492,060
325	4,492,061

CLASS 52

97	4,492,062
309.7	4,492,063
309.8	4,492,064
595	4,492,065
668	4,492,066
822	4,492,067

CLASS 53

331.5	4,492,068
436	4,492,069
438	4,492,070
442	4,492,071
586	4,492,072

CLASS 54

35	4,492,073

CLASS 56

364	4,492,074

CLASS 57

5	4,492,075
22	4,492,076
414	4,492,077

CLASS 60

39.31	4,492,078
274	4,492,079
388	4,492,080
547.1	4,492,081
589	4,492,082
641.5	4,492,083
648	4,492,084
649	4,492,085

CLASS 62

3	4,492,086
17	4,492,591
18	4,492,592
	4,492,593
45	4,492,087
55	4,492,088
	4,492,089
	4,492,090
180	4,492,091
181	4,492,092
238.6	4,492,093
262	4,492,094
293	4,492,095

CLASS 65

134	4,492,594
263	4,492,595

CLASS 66

11	4,492,096
108 R	4,492,097
202	4,492,098
	4,492,099

CLASS 70

34	4,492,100
370	4,492,101
421	Re.31,791

CLASS 71

90	4,492,596
92	4,492,597
93	4,492,598
	4,492,599

CLASS 72

53	4,492,102
55	4,492,103
56	4,492,104
302	4,492,105
453.02	4,492,106

CLASS 73

1 DV	4,492,107
35	4,492,108
	4,492,109
40.7	4,492,110
84	4,492,111
117.3	4,492,112
	4,492,114
118	4,492,113
151	4,492,115
432 R	4,492,116
597	4,492,117
612	4,492,118
621	4,492,119
625	4,492,120
705	4,492,121
708	4,492,122
755	4,492,123
864.44	4,492,124

CLASS 74

10.33	4,492,125
41	4,492,126
50	4,492,127
471 XY	4,492,128
473 P	4,492,130
473 R	4,492,129
574	4,492,131

CLASS 81

3.1 R	4,492,132
57.3	4,492,133
57.34	4,492,134

CLASS 83

155	4,492,135
169	4,492,136
175	4,492,137
203	4,492,138
727	4,492,139
839	4,492,140
852	4,492,141

CLASS 84

1.03	4,492,142

CLASS 89

1.816	4,492,143
33.17	4,492,144
33.2	4,492,145

CLASS 91

29	4,492,146
306	4,492,147
523	4,492,148

CLASS 92

5 R	4,492,149
13.6	4,492,150

CLASS 98

2.11	4,492,151

CLASS 99

397	4,492,152
460	4,492,153

CLASS 100

53	4,492,154
118	4,492,155
229 R	4,492,156

CLASS 101

71	4,492,157
	4,492,158
	4,492,159
	4,492,160
103	4,492,162
109	4,492,161
126	4,492,163
216	4,492,164

CLASS 102

313	4,492,165
384	4,492,166
470	4,492,167

CLASS 105

30	4,492,168

CLASS 106

14.34	4,492,600

CLASS 108

6	4,492,169
148	4,492,170

CLASS 110

261	4,492,171

CLASS 111

1	4,492,172

CLASS 112

240	4,492,173
248	4,492,174

CLASS 114

39	4,492,175
56	4,492,176

CLASS 118

651	4,492,177
653	4,492,178
689	4,492,179
704	4,492,180
718	4,492,181

CLASS 119

51 R	4,492,182
51.13	4,492,183

CLASS 122

4 D	4,492,184
32	4,492,185
382	4,492,186
390	4,492,187

CLASS 123

58 R	4,492,188
90.38	4,492,189
185 A	4,492,190
198 F	4,492,191
	4,492,192
276	4,492,193
	4,492,194
339	4,492,195
357	4,492,196
413	4,492,198
440	4,492,199
450	4,492,200
470	4,492,201
478	4,492,202
	4,492,203
489	4,492,204
	4,492,205
491	4,492,206
527	4,452,207
	4,492,208
568	4,492,209
	4,492,210
585	4,492,211
590	4,492,212
630	4,492,197
644	4,492,213

CLASS 124

24 R	4,492,214

CLASS 126

9 R	4,492,215
21 A	4,492,216
39 B	4,492,217
96	4,492,218
427	4,492,219

CLASS 127

48	4,492,601

CLASS 128

17	4,492,220
24.1	4,492,221
25 R	4,492,222
57	4,492,223
75	4,492,224
87 R	4,492,225
92 BC	4,492,226
165	4,492,227
204.17	4,492,228
303 R	4,492,229
303.1	4,492,230
303.17	4,492,231
325	4,492,232
421	4,492,233
677	4,492,234
705	4,492,235
781	4,492,236

CLASS 130

27 R	4,492,237

CLASS 131

94	4,492,238
270	4,492,239
336	4,492,240

CLASS 132

37 R	4,492,241
53	4,492,242

CLASS 133

8 A	4,492,243

CLASS 134

181	Re.31,792

CLASS 136

212	4,492,809
255	4,492,810
	4,492,811
256	4,492,812
	4,492,813

CLASS 137

38	4,492,244
82	4,492,245
85	4,492,246
119	4,492,247
236 R	4,492,248
515	4,492,249
590	4,492,250
596.16	4,492,251
625.43	4,492,252
849	4,492,253

CLASS 139

11	4,492,254
	4,492,255
92	4,492,256
304	4,492,257

CLASS 141

1	4,492,258
198	4,492,259

CLASS 145

5 R	4,492,260

CLASS 148

11.5 C	4,492,602
15.5	4,492,604
31.5	4,492,603
174	4,492,605

CLASS 156

79	4,492,606
242	4,492,607
467	4,492,608
507	4,492,609
643	4,492,610

CLASS 160

126	4,492,262
228	4,492,263
309	Re.31,793
319	4,492,261

CLASS 162

358	4,492,611
360 R	4,492,612

CLASS 164

292	4,492,264
493	4,492,265

CLASS 165

104.26	4,492,266
104.32	4,492,267
166	4,492,268
172	4,492,269

CLASS 166

358	4,492,270

CLASS 172

43	4,492,271
178	4,492,272
520	4,492,273

CLASS 174

50.64	4,492,814
78	4,492,815
92	4,492,816
152 R	4,492,817

CLASS 175

19	4,492,274
46	4,492,275
61	4,492,276
329	4,492,277
410	4,492,278

CLASS 177

45	4,492,279
211	4,492,280
213	4,492,281

CLASS 178

18	4,492,818
	4,492,819

CLASS 179

5 P	4,492,820
18 FA	4,492,821
81 B	4,492,824
81 R	4,492,822
	4,492,823
111 R	4,492,825
115.5 PS	4,492,826
115.5 SF	4,492,827

CLASS 180

68.1	4,492,282
148	4,492,283
219	4,492,284

CLASS 181

114	4,492,285

CLASS 182

93	4,492,286

CLASS 185

33	4,492,287

CLASS 187

29 R	4,492,288

CLASS 188

73.35	Re.31,794
79.5 GE	4,492,289
322.14	4,492,290
377	4,492,291

CLASS 192

67 R	4,492,292
89 B	4,492,293

CLASS 193

25 C	4,492,294

CLASS 194

4 C	4,492,295
100 A	4,492,296

CLASS 198

345	4,492,297
409	4,492,298
417	4,492,299
443	4,492,300
472	4,492,301
671	4,492,302
750	4,492,303
837	4,492,304

CLASS 200

5 A	4,492,829
5 R	4,492,828
6 A	4,492,830
50 A	4,492,831
52 R	4,492,832
61.78	4,492,833
84 R	4,492,834
144 B	Re.31,797
	4,492,835

144 R 4,492,837
159 A 4,492,836
4,492,838

CLASS 203

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CLASS 204

1 T 4,492,614
28 4,492,615
33 4,492,616
73 R 4,492,617
152 4,492,618
158 R 4,492,619
192 R 4,492,620
261 4,492,621
403 4,492,622

CLASS 206

210 4,492,305
216 4,492,306
449 4,492,307
610 4,492,308

CLASS 208

10 4,492,623
78 4,492,624
131 4,492,625
251 H 4,492,626

CLASS 209

3 4,492,627
5 4,492,628
332 4,492,629

CLASS 210

117 4,492,630
127 4,492,631
168 4,492,632
223 4,492,633
398 4,492,634
519 4,492,635
706 4,492,636
711 4,492,637
728 4,492,638
746 4,492,639

CLASS 211

65 4,492,309

CLASS 212

191 4,492,310
264 4,492,311
4,492,312

CLASS 215

1 C 4,492,313

CLASS 219

10.55 R 4,492,839
10.57 4,492,840
69 R 4,492,841
85 M 4,492,842
121 LC 4,492,843
4,492,844
4,492,846
121 P 4,492,845
124.34 4,492,847
127 4,492,848
137 WM 4,492,849
145.21 4,492,850
201 4,492,851
405 4,492,852
432 4,492,853
521 4,492,854

CLASS 220

71 4,492,314

CLASS 221

186 4,492,315
202 4,492,316

CLASS 222

39 4,492,317
79 4,492,318
108 4,492,319
398 4,492,320
410 4,492,321
420 4,492,322
465 R 4,492,323
529 4,492,324

CLASS 223

99 4,492,325

CLASS 224

160 4,492,326

CLASS 226

177 4,492,327
197 4,492,328

CLASS 227

10 4,492,329
67 4,492,330

CLASS 229

2.5 BC 4,492,331
15 4,492,332
22 4,492,333
69 4,492,334

CLASS 232

35 4,492,335

CLASS 235

458 4,492,855

CLASS 236

20 A 4,492,336

CLASS 239

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102 4,492,338
230 4,492,339
265.25 4,492,340
686 4,492,341

CLASS 241

67 4,492,342
95 4,492,343

CLASS 242

1 4,492,344
54 R Re.31,795
67.3 R 4,492,345
72.1 4,492,346
84.2 R 4,492,347
107.2 4,492,348
107.4 A 4,492,349
118.4 4,492,350
197 4,492,351

CLASS 244

3.15 4,492,352
12.4 4,492,353

CLASS 248

163.1 4,492,354
206.5 4,492,355
346 4,492,356
674 4,492,357

CLASS 249

18 4,492,358

CLASS 250

201 4,492,856
211 R 4,492,857
214 P 4,492,858
216 4,492,859
227 4,492,860
237 G 4,492,861
255 4,492,862
256 4,492,863
259 4,492,864
265 4,492,865
305 4,492,866
341 4,492,867
345 4,492,868
367 4,492,869
398 4,492,870
459.1 4,492,871
484.1 4,492,872
492.3 4,492,873

CLASS 251

1 A 4,492,359
129 4,492,360
356 4,492,361
363 4,492,362

CLASS 252

46.3 4,492,640
48.4 4,492,641
49.6 4,492,642
4,492,643
522 A 4,492,644
522 R 4,492,645
528 4,492,646
573 4,492,647
582 4,492,648
630 4,492,649

CLASS 254

394 4,492,363

CLASS 256

47 4,492,364

CLASS 260

112.5 R 4,492,650
112.5 S 4,492,651
429.2 4,492,655
453 RZ 4,492,656
453.7 4,492,657
455 A 4,492,658
925 4,492,659
966 4,492,660
976 4,492,661

CLASS 264

40.1 4,492,662
45.4 4,492,663
46.2 4,492,664
65 4,492,665
261 4,492,666

CLASS 266

220 4,492,365

CLASS 267

140.1 4,492,366

CLASS 269

8 4,492,367
32 4,492,368
60 4,492,369
182 4,492,370

CLASS 271

21 4,492,371

CLASS 272

1 C 4,492,372
61 4,492,373
114 4,492,374
134 4,492,375
138 4,492,376

CLASS 273

84 R 4,492,377
142 HA 4,492,378
143 R 4,492,379
411 4,492,380

CLASS 277

2 4,492,381
12 4,492,382
34 4,492,383
237 R 4,492,384

CLASS 280

7.13 4,492,385
507 4,492,386
624 4,492,387
651 4,492,388
704 4,492,389

CLASS 281

31 4,492,390

CLASS 285

114 4,492,391
119 4,492,392
236 4,492,393

CLASS 290

40 B 4,492,874
53 4,492,875

CLASS 292

64 4,492,394
216 4,492,395
228 4,492,396
341.18 4,492,397

CLASS 293

120 4,492,398

CLASS 294

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88 4,492,400
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103 CG 4,492,402

CLASS 296

65 R 4,492,403
97 J 4,492,404
146 4,492,405
217 4,492,406

CLASS 297

78 4,492,407
344 4,492,408
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CLASS 299

43 4,492,410

CLASS 303

6 C 4,492,411
32 4,492,412
92 4,492,413
116 4,492,414

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95 4,492,877
127 4,492,878
248 4,492,879
252 N 4,492,880
270 4,492,881
497 4,492,882
571 4,492,883

CLASS 310

45 4,492,884
62 4,492,885
68 C 4,492,886
68 R 4,492,887
71 4,492,888
87 4,492,889
184 4,492,890
328 4,492,891
345 4,492,892

CLASS 312

9 4,492,417
220 4,492,418

CLASS 313

318 4,492,893
414 4,492,894

CLASS 315

82 4,492,895
153 4,492,896
219 4,492,897
248 4,492,898
308 4,492,899
411 4,492,900

CLASS 318

85 4,492,901
254 4,492,902
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444 4,492,904
470 4,492,905
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586 4,492,907
663 4,492,908
696 4,492,909
772 4,492,910
779 4,492,911

CLASS 320

6 4,492,912

CLASS 323

282 4,492,913
313 4,492,914

CLASS 324

58.5 R 4,492,915
60 CD 4,492,916
77 A 4,492,917
83 R 4,492,918
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146 4,492,920
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207 4,492,922
4,492,923
330 4,492,924
418 4,492,925

CLASS 329

205 R 4,492,926

CLASS 330

9 4,492,927
126 4,492,928
253 4,492,929
284 4,492,930
294 4,492,931
300 4,492,932

CLASS 331

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117 R 4,492,934
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CLASS 332

19 4,492,936

CLASS 333

103 4,492,937
111 4,492,938
116 4,492,939
194 4,492,940

CLASS 335

13 4,492,941
202 4,492,942
213 4,492,943

CLASS 336

69 4,492,944

CLASS 337

229 4,492,945
365 4,492,946

CLASS 338

22 R 4,492,947
25 4,492,948
114 4,492,949
162 4,492,950
316 4,492,951

CLASS 339

18 C 4,492,419
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59 R 4,492,421
95 R 4,492,422
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CLASS 340

52 F 4,492,952
347 AD 4,492,953
347 DA 4,492,954
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777 4,492,957
825.25 4,492,958
825.56 4,492,959

CLASS 343

5 DD 4,492,960
7.3 4,492,961
369 4,492,962
464 4,492,963
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CLASS 346

1.1 4,492,965
33 A 4,492,966
135.1 4,492,967
140 R 4,492,968
4,492,969
160 4,492,970

CLASS 350

96.10 4,492,424
96.14 4,492,425
96.15 4,492,426
96.20 4,492,427
96.30 4,492,428
257 4,492,429
310 4,492,431
338 4,492,432
339 R 4,492,433
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360 4,492,435
395 4,492,436
428 4,492,437
432 4,492,438
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445 4,492,440
516 4,492,441
631 4,492,430

CLASS 353

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4,492,444
180 4,492,445
215 4,492,446
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330 4,492,986
332 4,492,987
336 4,492,988

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CLASS 367

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189 4,493,067

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75.1 4,493,069
77.2 4,493,070
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271 4,493,072

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CLASS 404

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CLASS 405

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420 4,492,771

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CLASSIFICATION OF DESIGNS

5—	60	277,060		480	277,057			277,074		146	277,092		10	277,108			277,123
D1—	130	277,044		566	277,055		367	277,077		180	277,093	D20—	11	277,109			277,125
	199	277,045		575	277,061		378	277,078		209	277,094			277,110	D22—	1	277,126
D2—	24	277,046		580	277,062			277,079		307	277,095			277,111	D23—	7	277,127
		277,047		601	277,059		434	277,080	D14—	53	277,096			277,112		55	277,128
	184	277,048	D7—	36	277,065	D10—	33	277,081			277,097			277,113		97	277,129
		277,049		43	277,066		61	277,082		68	277,098			277,114		122	277,130
	361	277,050		302	277,067			277,083		71	277,099		27	277,115		151	277,131
	394	277,051			277,068		83	277,084		76	277,100	D21—	59	277,124	D24—	8	277,132
		277,052			277,069	D11—	92	277,085		107	277,101		87	277,116		17	277,133
D6—	303	277,063		309	277,070	D12—	101	277,086	D15—	70	277,102		89	277,117		24	277,134
	373	277,053	D8—	52	277,071		102	277,087		80	277,103		120	277,118		38	277,135
	393	277,054	D9—	310	277,075		107	277,088		131	277,104			277,119			
	420	277,056		355	277,076			277,089	D16—	21	277,105		130	277,120	D25—	1	277,136
	467	277,064		366	277,072		110	277,090	D17—	18	277,106		159	277,121			277,137
	468	277,058			277,073		136	277,091	D18—	4	277,107			277,122		49	277,138

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